COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper – Second-class postage paid at Boston, Mass.

Vol. 2 No. 23 | June 5, 1968 | Price: $9/year

HP Gets First T-S Order

HANOVER, N.H. – An order placed by Time Share Corp. here with the Hewlett Packard Corp. of Palo Alto, Calif., marked the entry of both Hewlett Packard into the time sharing computer market and of Time Share into the time sharing service market.

Details of the HP 2000A system appear on Page 2.

The five computers concerned, 2000As with some modifications, are unusual systems designed primarily for inhouse time sharing using a single language, as opposed to the general systems which can utilize many languages.

Time Share's plans for the systems are also somewhat unusual. The company up to now has not had its own time sharing software, and has mainly been involved in consulting and educational services operations since it was formed in 1966. Now that it is moving into the time sharing service area it intends to concentrate on providing services to users, rather than on selling blocks of time.

"We think that there are many people who can use a terminal on their own premises," Anthony Beuschel told COMPUTERWORLD after the purchase of the systems was announced.

"We will provide the programs and the management for these clients as necessary."

The firm expects to find clients in the education field as well as in purely scientific or business operations. Current plans anticipate that operations will start early next year.

Modified Systems

The systems being bought by Time Share are larger than the standard HP 2000A, to allow for back-up and dumping. They will include larger disk memories and a nine-channel tape for dumping.

WU, CSC Huddle As UCC Backs Off

LOS ANGELES – The unexpected marriage of Western Union and Computer Sciences Corp. was rapidly approaching consumation last week. Meanwhile, the jilted suitor for WU's hand, University Computing Corp., withdrew its $44 per share offer for WU stock and announced it might consider setting up a common carrier subsidiary of its own.

The proposed WU-CSC merger, first announced May 21, was approved in principle by CSC's directors May 27. Similar action by WU's directors was expected to follow shortly.

Only days before the merger agreement was announced, CSC had flatly denied that negotiations were in progress or were being considered. Many industry sources look on the whole action as simply a move to head off UCC at the pass.

WU has already declared its intention to become a nationwide information utility network, and the merger would, in effect, put CSC "on-line" with the entire country.

The merger still is subject to approval by stockholders, regulatory commissions, and other authorities.

"We are entering a new era in which computers and communications systems will be linked in rapidly increasing numbers," said Fletcher Jones, CSC chairman. "These combined computer-communications networks will provide society with an unprecedented capability for high speed gathering, organizing, processing, and transmitting of information."

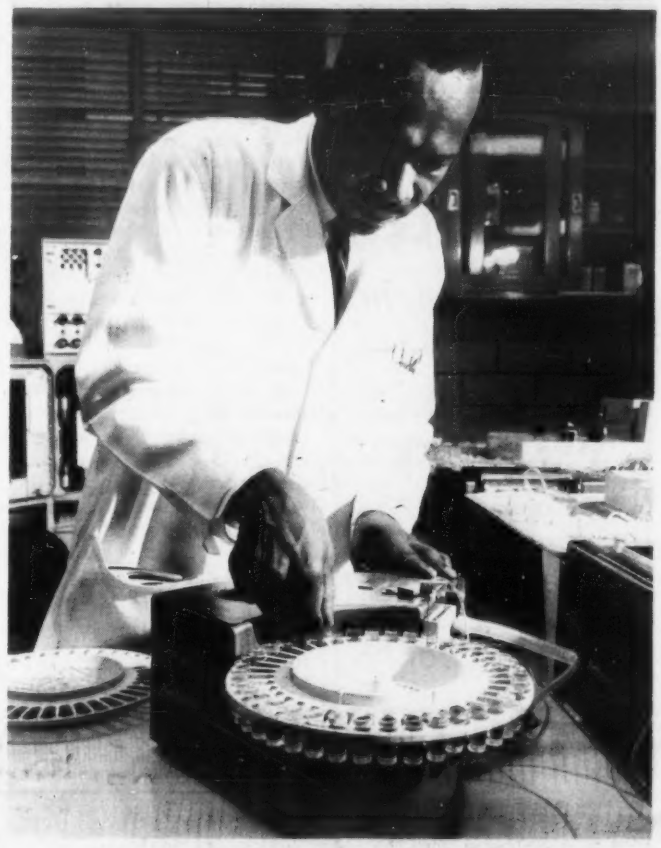
Under the agreement, common shareholders of WU would receive one share of a new $3 convertible preferred of CSC for each of two shares of WU common. Each share of the new preferred would be convertible into approximately 1.54 shares of CSC common (on the basis of a price of $65 per share for CSC common.)

In terminating its offer, UCC reported that fewer than the sought 750,000 shares were tendered and those shares would be returned to the tendering WU stockholders.

UCC said that returning the stock would enable the tendering WU stockholders to sell it on the open market at the now higher price than prevailed before the UCC $44 cash offer was made. UCC said further that if WU should merge with CSC, UCC would not wish to be a stockholder of CSC.

UCC announced its intention to explore means of providing data communications services for customers of its multi-national computer

(Continued on Page 12)



Automated Lab Tests

A technician loads specimens into a 12 channel Autoanalyzer in the Institute of Laboratory Medicine's automated laboratory. A computer system has taken over the New Jersey institute's testing, paperwork, and follow-up tasks, increasing efficiency and freeing the staff for other work. (Story on page 9.)

Second Users to Get IBM Support

WHITE PLAINS, N.Y. – IBM has relaxed the restrictions it had placed on the support it would provide for second and later users of leased systems. Until now, second users of equipment obtained through third party leasing companies were not provided with free training and program systems maintenance, although these services were made available at no extra charge to IBM customers.

In the relaxation, IBM is distinguishing between support efforts which are part of the marketing operation, as opposed to other support efforts. The corporation does not intend to provide marketing operation support (this category includes systems engineering) by creating programs for specific jobs.

The relaxation comes while the Justice Department is considering IBM's position in the industry, and while the Computer Lessors Association was preparing to go to court to force IBM to provide these services to secondary users. The association's opinion was that the denial of these services constituted a breach of the Sherman Antitrust Act.

Harvey Goodman, president of Data Processing Financial, commented, "I don't think IBM would have taken this step if they had not been constrained to." He felt that under the new circumstances it would not be necessary to continue with the suit.

Goodman said that some users had been reluctant to do business with the leasing companies because of the stigma of being second users. He said IBM's relaxed policy would enable the leasing companies to go after 100% of the market.

"Those of us who were thinking of staffing up to handle these services ourselves won't have to," said John M. Randolph, chairman of Randolph Computer Corp.

Howard S. Levin, president of Levin-Townsend Computer Corp., said his firm had been able to move two dozen systems to second users without any problems, so he didn't think the new IBM policy change would make much difference. But he thought the change could be very helpful in making it easier for computer companies to raise money.

Joint Chiefs Seek Tight Standards

BURLINGTON, Mass. – More rigid computer compatibility standards than ever before have been approved by the Joint Chiefs of Staff for the next massive computer procurement, Major Gen. Gordon T. Gould Jr., director of the Air Force's command and control communication, said in a speech here before the National Security Industrial Association. He noted that there were "at least four" manufacturers who could meet the specifications with off-the-shelf equipment.

"We don't want to stifle technical progress or competition in the computer industry in what has been a very rapidly changing technology, but we have reached the point where we can't allow everyone to go in his own direction," the general declared.

The system is the worldwide command and control system, and involves an expected order for more than 100 computers. The systems will be used by the Army, Navy, and Air Force, as well as in other Defense Department agencies. Because of this widespread use it is expected that the influence of this new procurement will be greater than that of the recent Air Force Phase II award, which was given first to IBM and then, after the controller general had upset the award, to Burroughs Corp.

Industry observers suggested that the four firms being referred to by Gould were probably IBM, Honeywell, Burroughs, and RCA, although GE was also thought to be a possibility. Fears as to the effect of the procurement on the industry were based on two distinct problems: one, that the winner of a sole-source procurement would be in an unbeatable position for follow-on work, and two, that compatibility would effectively restrict competition to a handful of firms out of the scores in the industry.

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Details of the HP 2000A System

Below is a technical description of the new Hewlett-Packard HP 2000A time sharing system (see story on page 1)

The HP 2000A time sharing system can be used by up to 16 persons at a time. The transparent doors of the computer, left, can be kept locked.

HARDWARE

The teleprinters used as terminals with the system are modified ASR-33's made by the Teletype Corp. Up to 16 can be used with the system at the same time.

Connection between the user's teleprinters and the system can be by direct wiring or by telephone lines.

Direct wiring is practical to at least one mile. Connection through telephone lines via Bell System's Data Set 103A is practical nearly anywhere in the country. Acoustic couplers that allow data communications through normal voice telephones are also used for shorter distances. Space is provided in the system cabinet for 16 Data Sets or for other connection apparatus.

The time sharing system uses the HP 2116 computer with a 16-bit word length (plus parity) and 16,384 words of magnetic core memory. Memory cycle time is 1.6 microseconds. Interface to the required peripherals is through plug-in input/output cards and standard cabling.

Disk Memory

For bulk high speed memory, the system uses the HP 2757A-M1 disk memory with 348,160 words of storage. The disk is used for storage of active programs (up to 90K words), for storage of the file copy of the system executive (10K words), and for storage of inactive user programs (248K words). The disk's short average access time, 16 milliseconds, coupled with the executive's optimum timing techniques assure the efficiency required for handling the maximum 16 users at once.

Peripheral Options

For operation during non-time sharing periods a range of peripheral devices is available, including high speed tape punch, magnetic tape recorders, high speed card readers, line printers, oscilloscope displays, and plotters.

SOFTWARE

Conversational Languages

Only a single language is available in time sharing mode. The selected language is Conversational Basic, developed at Dartmouth, and the recommended textbook is Kemeny's & Kurtz's "Basic Programming" (John Wiley) or Sharpe's "Basic" (Free Press) rather than some company produced manual.

A terminal user, however, is not restricted to Basic in his normal day-to-day work as the terminals are compatible with the various other time sharing utilities, and a user wanting to use another language need simply subscribe to an outside service and dial another number when he needs to.

Facilities

Time Sharing Executive

The executive program directs the computer's support of input/output demands, program execution, library service, and the accounting system. It operates on a priority basis to provide the user of the system with prompt response.

Accounting System

An accounting system is furnished that can be used to control access to the computer and also accumulate information for statistical studies, or for billing users. When used, the accounting system requires each user to type in his account number and password in order to gain access to the system. The system then records the number of minutes of terminal time used. Data is accumulated by the system until interrogated and reset through the system control teleprinter.

Library System

Two types of libraries are maintained on the disk by the executive program. A public library of programs, available to any user but changeable only by the originator, is maintained by the system on the disk. The system command "library" causes the system to list the names of all public programs.

The private library is maintained for each user; the command "files" causes the system to list the names of all the user's saved programs.

Other Operating Modes

The hardware of the time sharing system can be used for other purposes by putting the time sharing system to "sleep." A full range of software systems is furnished with the time sharing system including the following:

HP Assembler

The assembler processes a machine oriented language providing the flexibility of hardware instructions. The language includes machine operation codes, assembler-directing pseudo codes, and symbolic addressing. The output may be absolute or relocatable. Relocatable code is linkable to Fortran or Algol code.

Fortran

The Fortran compiler accepts source programs written in ASA Basic Fortran with many useful additions. It produces a relocatable machine language object program which can be loaded under control of the Basic Control System.

Algol

The Algol compiler allows programming in this internationally defined algorithmic language and produces a relocatable program in one pass. The compiler incorporates all major elements described in the "Algol 60 Revised Report, Communications of the ACM," January 1963, plus many additional significant features.

Suggested Uses

While the HP 2000A can be used in many ways, the marketing of the system is expected to be concentrated on the inhouse time sharing operation and the educational field. The approach to the inhouse situation will simply be:

"Are you spending $X or more monthly on buying Conversational Basic from outside? If so – it's cheaper to have an inside system!" Just what the $X figure is is not clear, but it appears to be between $3000 and $4000 a month.

On-line Grading

In the educational field particular emphasis is being put upon the use of the HP 2760A Optical Mark Reader as an input device. Standard tab cards are printed with a reflective ink which is visible to the eye but not to the photo-sensors of the 2760A, and these can then be marked or erased with pencil and eraser. The particular use of this is in grading classes because it is reckoned that scoring and analysis for a normal size class would require only a few minutes of terminal time.

Costs

Hewlett-Packard is claiming a cost of under $2 per user terminal hour when a system is being used to provide 16 terminal hours a day. The actual system price is $89,500 including the computer, a 348K 16-bit word disk with room for 500 "average" sized programs, and a control teleprinter.

The company explains that the low cost is possible because of the decision to restrict the system to a single language – Basic – which is said to be at present the major one used by time sharing users.

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6 Students Win CDC Scholarships

ARLINGTON, Va. – Scholarships totaling more than $13,000 have been awarded to six area high school students by Control Data Corp. for study in the computer manufacturer's education program at Control Data Institute (CDI) here.

Charles H. Hiser, director of the Arlington CDI, said each scholarship covers all tuition and fees for whichever of the two basic courses the individual student will pursue: the six-month programming technology course or the 10 month computer technology course.

The six recipients were among some 100 high school seniors in the area who competed in a comprehensive exam given last month at the institute.

Character Display System Improved

LOS ANGELES, Calif. – A new style of character generator which provides more uniform illumination of aesthetically pleasing characters was described here by William R. Lamoureux of IBM, at the SID Ninth Annual Symposium here.

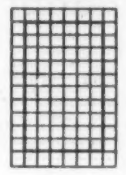
The generator breaks down a character into as many as 40 small parts, and strokes over them like a pencil. Because of the comparatively large number of parts, the problems previously associated with strokes becoming faster and slower (and so making the display appear darker and brighter in different parts of the stroke) have been overcome.

New Coding System

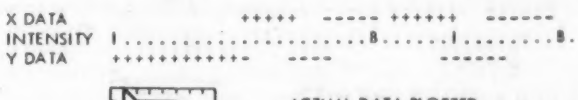
The new system, which involved greatly increasing the number of parts of each letter which had to be held in the storage area, used a new coding technique to reduce the storage problem. Instead of holding X and Y coordinates for each stroke point, a 5-bit procedure was used. This simply defined whether on the next stroke the movement was to be in the +X, the –X, the +Y, or the –Y direction; and as to whether it was to be illuminated or not. The data was called out of the specially designed read-only memory with a single instruction.

While each separate movement is still restricted and must be either along or at 45 degrees to one of the principle axes, the number of parts into which the letter is broken allows the appearance of the letters to be improved when they are seen as an integrated whole.

The construction of a letter 'B' from the original 5 bit codes is illustrated here. The codes are interpreted as indicating whether the next move is to be in the + or – X direction; the + or – Y direction; and whether or not the stroke is to be illuminated. The actual length of each stroke is kept standard.



CHARACTER GRID 6 X 10
WITH OVERDRIVE
ZONES 8 X 12



ACTUAL DATA PLOTTED
AS LISTED

The plotting starts at the left-hand bottom corner of the main grid, up the left hand of the letter, round the upper loop before the illumination is turned off while the scan reverses itself over the middle horizontal stroke between the two loops. Then, re-illuminating itself it makes the final (lower) loop.

THE INTEGRATED RESULT

Subcommittee Says U.S. Should Use Small Firms

WASHINGTON, D.C. – The United States should make it possible for smaller manufacturers to supply computer equipment directly to government users, according to a recommendation of the Joint Subcommittee on Economy in Government headed by Sen. W. Proxmire of Wisconsin.

After their hearings earlier in the year, the subcommittee found that present government procurement practices have tended to favor the larger manufacturers of computers, thus stifling competition. The subcommittee said specifications should not be designed around the products of certain companies, presumably meaning the larger computer companies.

The subcommittee also pointed out that satisfactory levels of centralized control over new acquisitions of computers had still not been achieved.

In the past several years there has been phenomenal growth in the use of data processing systems by the federal government. The government now spends about $3 billion annually for the purchase and lease of equipment. Last year government owned equipment that cost $80 million was declared excess to the needs of the owning agencies, the subcommittee reported.

Despite the huge costs of procurement, no satisfactory inventory of equipment has been developed, the subcommittee said.

All government owned EDP equipment, including that furnished to contractors, should be inventoried as soon as possible, the subcommittee said, and the records then should be kept up to date to avoid unneeded future purchases.

Disk Pack Price Level May Drop

Reports from across the country during the past week suggest that disk pack prices are softening slightly under the pressure of the new manufacturing and distributing operations which have started up in the past six months. Currently there are known to be over 20 manufacturers and "private brands" of IBM 2311 compatible disk packs on the market. More are expected to announce shortly.

Almost all of these list their price at $490 per pack, the same as the IBM price, and have been concentrating upon giving faster delivery as the way to make sales. While there have been no announcements of any changes in list prices, individual customers have apparently been offered price reductions ranging from a few dollars to nearly 10%

Computers to Help Report Indianapolis 500 Race

INDIANAPOLIS, Ind. – Fast cars and computers will be paired at this year's Indianapolis 500-mile race to bring more information faster to racing fans throughout the world.

The race will be shown in 175 theaters across the country via closed circuit TV and will be broadcast via satellite to the Middle East, and by special cable to Mexico, Central and South America, Canada, Australia, and New Zealand.

Computers will contribute to the May 30 telecasts by providing information on timings and cash earnings.

As the four hour race progresses, GE time sharing computers in Chicago will be monitoring contestants, laps, and other race details. Key information will be displayed on a Datanet-760 data display terminal and relayed to the viewing audience at specified intervals. Information between the Indianapolis Speedway and the computers will be exchanged through regular telephone lines.

The 10 leaders will be identified at the end of 20 laps. At 50 lap intervals, information about the entire field will be presented. At 30 lap intervals, the system will indicate the cash prizes awarded to each contestant.

Whenever a contestant makes a definite move to improve his position in the field, the computer will calculate how many laps it would take him to overcome the current leader.

Comparisons between individual lap times and outstanding performances in previous Indianapolis races will be isolated and displayed by the computer.

System Monitors Statewide Power Circuits

NEWARK, N.J. – Public Service Electric and Gas Co. has installed a computer directed information gathering and display system to monitor electric operations.

The installation monitors 700 quantities at nine generating stations and 28 major transmission and switching stations throughout the utility's area, which extends from Newark in the north to Camden in the south. At the touch of a button the company's system load dispatchers can get a video display of conditions at key points throughout the 2400 square mile electric power complex.

A GE-PAC process computer is connected by GE-TAC supervisory controls to continuously transmit and receive digitally coded information such as current flows, voltage levels, power interchange and circuit breaker positions. The data is displayed on a Datanet screen, which can show a diagram of the electrical system at any station with conditions as they exist at the moment.

The computer at the Newark Load Dispatching Office also uses automatic typewriters to print data of system conditions for record purposes or for future studies.

Robert A. Baker, vice president of electric operation, said that "at the control center, the load dispatcher gets an up to the minute view of the power system. He no longer must rely solely on telephone messages and the readings of a few recorders.

"The computer also performs a security check of the electric system. It spots abnormalities, alarms the dispatcher, and recommends corrective action as required. The dispatcher can obtain further information on station conditions by pressing a button and viewing the display on the TV screen."

The system is also linked with a computer in Philadelphia which monitors the Pennsylvania–New Jersey–Maryland (PJM) Interconnection, a power pool of 15 utilities. This is believed to be the first operating tie where electric utility system computers are talking to each other. The link is used to exchange data vital to the operation of the PJM interconnection.

Public Service is considering future refinements in order to expand the computer's capability, Baker said. It could be used to televise summaries of operating information to other locations for use as a management tool.

The computer also will provide the information required for reactive power dispatch. Reactive power is required to properly energize a customer's equipment.

A Public Service load dispatcher checks video display of up to the minute information on voltage and breaker positions. Conditions throughout Public Service's 2400 square mile service complex can be displayed instantaneously by calling the information from the GE-PAC process computer.

Editorials

Let's Re-evaluate

The action of the Defense Department in setting more stringent compatibility standards for the procurement of computers is understandable. We, in the industry, have been inexcusably lax in this matter and outsiders cannot be expected to pay for our repeated blunders without taking some defensive action.

Whether the action currently intended is well advised is another matter. General Gould's statement that there are "at least four" manufacturers who can meet the specifications with off-the-shelf equipment rather strongly suggests that the result of the new standards will be to severely restrict competition.

COMPUTERWORLD feels that this is unfair and – more than that – technically unnecessary.

Compatibility can be obtained without such unfairness. It can be obtained by specifying standard interfaces, standard maintenance practices, standard languages and standard manuals. Then competition – and economy – can thrive.

We earnestly suggest that the Defense Department re-evaluate its position before it pulls another Phase II boner, and that it come to the industry to find out how it can be done before restricting competition in this way.

Hello, H-P

The success of Hewlett-Packard in selling a number of the time sharing systems before the brochures have been printed surely brings them into the ranks of serious computer manufacturers. The H-P 2000 A is not a "me too" copy of anything. It is a unique product designed to fit an identified need. It is an economical first step to inhouse time sharing which does not try to do everything, but simply is dedicated to one language. This dedication saves overheads – and does not inhibit the user from using other languages through various commercial services. In short, it is a useful system.

We are glad to find such fresh thinking coming up and suggest that you now add Hewlett-Packard to your list of firms to be watched . . . .and considered.

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Subscription rates are: $9 for one year, $16 for two years. Add $1 per year for Canada; $3 per year for Foreign. Please send all editorial and subscription material to: COMPUTERWORLD, 60 Austin St., Newton, Mass. 02160. (617) 332-5606.

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Letters to the Editor

Two Views From GE

To the Editor:

Would you please cancel my subscription to COMPUTERWORLD immediately. There *are* computer manufacturers other than IBM.

R.B. Hadeler
Customer Applications Specialist
General Electric
Dallas

To the Editor:

It was during the DPMA Conference a year ago that your publication covered the introduction of the GE-420 time sharing system – which means that COMPUTERWORLD is rapidly approaching its first birthday.

Congratulations on an eventful and contributive year.

Don Young, Press Relations
General Electric
Phoenix

Performance Claims

To the Editor:

Your May 22 editorial questions standards for computer performance claims.

IBM does have careful and consistent standards for performance claims. We defined them for you.

It is true, that, in general publications, we state maximum capabilities. This follows the accepted industrial practice of "rated" performance characteristics. To do otherwise would be misleading, because it is impossible to generalize about computer performance in customer installations, where many variables affect performance.

It is our practice always clearly to identify such capability ratings as maximum figures.

In fairness, we request that you publish this letter.

W.B. Jones
Director of Communications
IBM
White Plains, N.Y.

The implied assertion that the use of the maximum instruction/second rate of 12.5 million for the 360/85 is in accordance with "accepted industrial practice," is incorrect. The standard method is to use actual known performance, Gibson mixes, or other methods to prevent exaggerations. The Control Data 6600, for instance, would have a "maximum" rate of 10 million instructions/second – but its "insts/sec" rate is quoted by that company at the realistic 3 million/second.

The acceptability of any set of standards must ultimately be judged by the value of the information which results from applying the standards. The IBM performance claims for the Model 85 misled the editors of Modern Data Systems and Datamation.

COMPUTERWORLD continues to advocate that computer manufacturers express performance claims in a realistic manner. Ed.

Question Posed

To the Editor:

I have just finished reading your Career Column for April 24, 1968, entitled "Big Raises May Be Best Incentive For Analysts." The article is devoted to the personnel salary policies recommended by Dr. Saul W. Gellerman. My experience as an employer of upper and middle level technical people closely parallels Dr. Gellerman's conclusions. We too have found that the desire for substantial salary increases is recurrent and unrelated to the employee's performance or salary level. I also have to agree that large salary increases should be limited to innovative, upper level personnel and those who carry heavy individual responsibility.

However, those twin conclusions define a dilemma for an employer. Since the desire for an increase is recurrent, the effect of a raise, even a large one, is quickly lost and the employer must either find a way to justify additional raises or find a substitute to fill the psychological void. Even small periodic raises cannot be repeated indefinitely without overcharging our clients, most of whom have a pretty fair idea of what our services should cost. Thus whether a large "princely" raise or a small, periodic raise is in order for a particular employee, the employer sooner or later finds it impossible.

It is at this point that a substitute must be found and I for one have never found a generally useful one. Fringe benefits are as chimerical as raises; they seldom have any effect beyond a few months. "Concern for employee's welfare," if by that phrase Dr. Gellerman means a friendly empathy for one's employees as people, may be even worse. Many employees develop an addictive appetite for interest and approval and make ever increasing demands on the employer's time. I am convinced that in the extreme the employer becomes a father rather than a boss, and the resulting sibling rivalries can tear a professional office apart.

Fundamentally, the problem (it seems to me) is that every man needs something to hope for and most of them look to their employers to provide it. If additional raises eventually become impossible, and there is no workable substitute, I wonder if the problem is in fact solvable. I would be grateful for Dr. Gellerman's comments.

James P. Collins
Consulting Engineer
Cambridge, Massachusetts

Pure Bull?

To the Editor:

Life is full of little ironies in surprising places. Now, take the case of the public relations handout by General Electric printed in the May 15 issue of COMPUTERWORLD, on their COC-5 type font being offered as a United States standard for optical character recognition. The story says, "The COC-5 technique was originally developed by GE for use with the MICR (magnetic ink character recognition) system which GE introduced to the banking industry in 1958."

How well I remember a decade ago when GE had picked up the ERMA project from the Bank of America and Stanford Research Institute. ERMA used an analog scheme of character recognition that required rather grotesquely shaped numbers which survive in today's MICR Standard. At about the same time as GE was pressing for their peculiar characters, Cie des Machines Bull, of France, announced the development of a simple, elegant, legible, and reliable font based upon coded bar-widths within each symbol. When I first saw the Bull proposal, I said to all who would listen at IBM's Poughkeepsie laboratories (where I was working at the time) that their's was the way to go. But youth is youth, politics is politics, and special interest have a way of overriding simplicity, elegance, and economy, so the banking industry adopted MICR, largely at GE's urging. Britain followed America with an MICR standard, and Bull succeeded in making some sales on the continent but not in the major EDP markets.

Everyone knows how Bull found themselves in great difficulties and how GE acquired a controlling interest in Bull's non-military business. GE, of course, picked up rights to a whole raft of Bull developments, including their coded characters. So here comes a PR man with a release which says that GE developed these characters for MICR, to which we *cognescenti* can only murmur, "Bull."

Sander Rubin
New York

Cobol and Data Bases

To the Editor:

Bully for you on your recent editorial, "Why Cobol Will Fail."

It appears to me that the real issue is not the difficulty of publication encountered by two major ACM groups, nor how involved these groups really are with the "fortunes of Cobol" nor how difficult the Data Base Task Group's report is to read, nor whether the report contained "proposed changes in the language" as you reported, or extensions to the language as they reported.

In my opinion the problem is whether the language needed data base capability in the first place. How was this decision made, who made it and who decides upon the order of importance for language extensions?

If I were to write an Editorial on Why Cobol Would Fail, it would contain as its major premise the unwillingness of the Cobol user to accept the responsibility to express in "shoutable English" his requirements to keep Cobol responsive to his data processing needs.

Howard Bromberg
Information Management Inc.
San Francisco

Extending the language would certainly change its fortunes – but the use of "change" was a slip for which we apologize. Ed.

Keypunch Review First Step Toward Tape Inscribers

This is the second in a series of articles on the new keyboard to tape units.

In last week's issue of COMPUTERWORLD we looked at the contenders who have announced their entries in the great keypunch replacement market race.

But before looking at the detailed descriptions of these units, we really must go back one, and perhaps two, steps.

Keypunches do not exist alone. No one would buy a keypunch just to place it on a pedestal and admire it. It is not a work of art. It is a working machine. It does something. It punches cards.

We are now looking at units which do not punch cards. Rather than compare them to the keypunch, we must first ask: "What is punching? Where does the data come from? What is the data being recorded on these cards? Why do we want it recorded? What are we going to do with it?" All these questions must be answered before we can seriously question which is the proper unit to replace our present keypunches.

Survey Your Operation

COMPUTERWORLD does not know what you are doing with your tab shop, but it can suggest a few things you ought to know about it before you start looking around for new equipment. Don't be surprised if you haven't looked at these particular points before. They are only now becoming important because of the new situation and the wider choice open to you.

The first thing to look at is the input data. Is it being prepared especially for your keypunches? Is there, in fact, a special step for this operation? If there is, possibly it can be avoided. Look behind the input documents from which you are currently punching, and find out where and how these are being created.

Secondly, take another look at the data. Is it easily understood, so that a quick look can verify that it has been checked? Is it difficult to read, thereby creating honest differences of opinion as to whether or not an item is a "7" or a "2"? Is it highly numeric – or mainly alpha?

As a third step, check out the program cards. Do you really use them, or are they incidental? Is it possible for your girls to work without them? Are they complicated to prepare? Do you often use a card with two programs?

Watch the verification processes. How often do errors occur? How often is the second operator incorrect?

What is done with the data? Is it sent straight to a computer? Is it always an IBM 360, or do you want to be able to send it to another computer? Would you like to be able to send it to some remote (or central) place quickly?

When you have sent the data to the computer, then what? Do you want the results returned to you quickly? In what type of form? Will you be satisfied with largely tabulated data? Or do you prefer a more easy-to-read format? Do you want it sent out to remote areas? Are these the same areas as the places where remote items are being originated?

You need to know about all these items. Find some of the answers, and then COMPUTERWORLD can look at the present situation – and you.

(To be continued.)

Review Check List

Major Characteristics of Internal Operations Which Should Be Studied Before Choosing a Specific Keypunch Replacement.

Data Characteristics

Is input document created specially?
Can input be checked by scanning?
Is input highly numeric?
Is input difficult to read?

Program Cards

Are program cards used much?
Are 2-program cards used much?
Are program cards complicated?

Verification

Are verification errors frequent?
Is verifier often wrong?

Computer

Do you want to use other than IBM 360s?

Communications

Do you want to transmit data?
Do you want to return reports to input station?

Here Are the Data Inscribers Already Announced

Manufacturer	Unit Name	Keyboard Style	Produces Computer Tape?	Price
Communitype	Communitype	Typewriter	No	$11,600 *
Honeywell	Keytape	Keypunch	Yes	7,250
IBM	Model 50 Inscriber	Keypunch	No**	9,900
IBM	Magnetic Tape/ Selectric Typewriter	Typewriter	No**	7,150
Mohawk***	1101 Data Recorder	Keypunch	Yes	7,200
Sangamo	Data Station	Keypunch	Yes	7,640
Tally	1021 Data Terminal	Typewriter	No**	10,800*
	4021 Data Terminal	Optional	Yes	15,000

** Communication facilities are included in the price*
***Can be read into IBM 360s via special reader.*
****Mohawk also makes the NCR 735 Data Recorder.*

Measure for Measure

Is First Pass Error Free Tape Certification Necessary?

Is first pass error free certification of magnetic tapes necessary?

The Claim

The 3M Corp., with its introduction of 777GP tape which is not certified "error-free," has claimed that the present day standard of magnetic tape – at least as far as 3M is concerned – no longer is adequately protected by first pass error free certification.

The Evidence

The corporation is publishing a chart showing the number of dropouts occurring during 200 passes of the 777GP tape, by comparison with the dropouts occurring with previous tapes. This chart shows that apparently no drop outs occur during the 200 passes.

The company, then points to the actual cost of certification, which involves running and reading the entire tape, and says that this expense does not prove anything, and would be often better used to reduce the price of the tape.

COMPUTERWORLD's Investigation

We first investigated the actual meaning of the chart. It turned out that the way the tests had been run was to write a specific pattern on them in a single, 2400 foot long block. This was then read back 200 times and checked for accuracy.

During this operation no attempt was made to simulate operating conditions. The tape was never dismounted from the tape drive. Indeed the tape drive window was never opened. Rewinds were at normal speed, not at high speed. No writing was attempted after the first operation.

We then checked the specifications and warranties of the 777GP tape, the certified 777 tape, and two earlier tapes. Here we particularly noted the entries under the headings "Signal Quality – Permanent Write-Errors – Ist Pass" and "Wear Resistance of Tape." These were as follows:

Signal Quality

Permanent write-errors – 1st Pass

		777GP	777 Cert.	768
800 bpi				
Average	1 or less	0	0	
Maximum	3 or less	0	0	
1600 bpi				
Average	2 or less	0	0	
Maximum	5 or less	0	0	

Wear Resistance

Number of possible permanent write-errors after 200 passes.

	777GP	777 Cert.	768
800 bpi			
Average	less than 1	1	4
Maximum	2	2	12

We then checked the meaning of the words "average" and "median" used in the warranties. The 3M Corp. assured us that these averages were meant to be used by the user – and that they were simply the result of his use of the tapes he received. Specifically the company denied that they would be interpreted as meaning the average of all the tapes 3M made.

We then checked on the claimed price reductions. The list prices for 2400 foot reels of 777 tape, with and without certification, are as follows for 100 to 499 lots:

	777GP	777 Cert.
800 bpi	$18.50	$25.50
1600 bpi	$18.50	$26.50

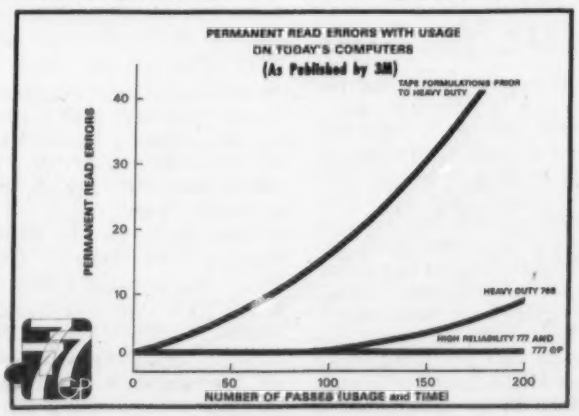
It therefore appeared that the uncertified tape was appreciably cheaper.

COMPUTERWORLD's Verdict

It is clear that there are now styles of tape which rub off appreciably less than older styles of tape, and that a standard which fails to reflect the result of the actual use of a tape (in the way that the present certification procedure fails to do) does not adequately display these characteristics. It is perfectly possible under these circumstances for a certified tape to have more read-write errors within a 200 pass lifetime without breaking its specifications than an uncertified tape. The price lists indicate that the savings are being passed on to the user.

The 3M Corp. therefore is justified in claiming that there are occasions when first pass error free certification is not valuable.

However, the charts published by 3M are inadequate in that they do not reflect what life can be expected under conditions which even vaguely approximate user operations. At the least these should include dismounting, high speed rewinds, and frequent rewriting. The warranty and specification sheets provided with the tape, rather than the charts, are the prime justification for the performance claim.



TLW Computerworld Corner

Item 1: NCR 315 Banking System: 10K SLAB, 2 CRAMS on line MICR sorter reader, 680 LPM printer with buffer.
Available August 15, 1968

Item 2: 1401-E4, 1402-1, 1403-2, 1406-1 and 5-7330's. The system is loaded presently in a bank. Excellent environment. Extra features include: M/D, serial I/O, Disk adapter, process overlap.
Available July 1

Item 3: 1401-C3, CPU, all features.
Available immediately.

Item 4: 729V Tape drives (3 of them)
Available immediately

Item 5: 1406-1, additional storage
Available immediately

Item 6: We need 2 1406-2's
Immediately

List Your Computers with TLW.

TLW Corp.
Box 29763
Atlanta, Ga.
30329
404-633-2579

FAA System Will Ease Traffic Control Problem

NEW YORK – An advanced computer system will be utilized for improved control of air traffic over the New York City metropolitan area by the Federal Aviation Administration.

The new facility is called the New York "Common" IFR (instrument flight rules) Room, because it will consolidate – in one room at John F. Kennedy Airport – the radar control of air traffic arriving and departing at Kennedy, LaGuardia, and Newark air terminals.

Operations with the computerized system will be implemented after system shakedown, late in 1968 or early in 1969. The manual New York Common IFR Room system is expected to be in operation by mid-July, 1968.

Univac 1219 computers are utilized in the alphanumeric portion of the IFR room. One tracks all aircraft in the vicinity. The other automatically generates the display of vital flight information on the flight controller's radar scope. Air traffic control specialists will be able to keep constant track of the location, identity, and altitude of up to 250 planes at a time.

3-D Control

A pilot system called Arts (advanced radar traffic control system), in operation at Atlanta, Ga., since 1964, is limited to 100 planes. Univac 1218 computers form the heart of that facility. Addition of exact altitude information to the controller's radar scopes, according to Univac, "literally creates three-dimensional radar and provides a major new safeguard against aerial collisions."

Controllers will be relieved of many manual tasks that consume their energy and time under the existing air traffic control system.

The Univac Federal Systems Division, St. Paul, Minn., functioned as system integration and checkout contractor for the alphanumeric portion of the New York Common IFR Room as well as hardware and softward supplier.

Along with the two 1219 computers, Univac provided two 1540 magnetic tape units, two 1532 input-output consoles, a 1004 card processor, and a 1262 teletype adapter.

Work on the $2 million contract began in August, 1966. It was fulfilled recently with acceptance of the system by the FAA.

American Orders PL/1 Compiler To Put Sabre System on S/360

CONTRACTS

Computer Usage Development Corp. (CUDC) received a contract from American Airlines for the development of a PL/1 Compiler. The principal requirement placed on this compiler is the production of object code that will perform efficiently in the real-time environment of the SABRE Reservation System. The compiler is part of a long range American Airlines program to shift the Sabre system gradually from the IBM 7090 to the IBM 360/65. The changeover will require rewriting and extensions in services of the Sabre application programs. The compiler will enable American to write real-time programs in a high level language.

The first phase of a three part study is under way at System Development Corp., Santa Monica, California to find the most effective way of spending tax dollars on law enforcement. An SDC study team is working with the Los Angeles County Sheriff's Department analyzing complaints, arrests, patrol logs, and other data concerning law enforcement activities in Norwalk. The study will assist city officials in making immediate decisions about law enforcement services and may well be the basis for a five year master plan. Included in the study is the exploration of various law enforcement options to determine which would be the most effective for the cost. Various methods of crime prevention will be considered, including improved street lighting, additional parks and recreational facilities, a broader community relations program, and a civic education program.

Formal contract arrangements have been made for Omni-Computer Systems to represent the SSI Computer Corp. in the development of leases of computer equipment. Under the terms of the arrangement, Omni-Computer Systems will be able to purchase and lease back IBM System/360s at a monthly cost and offer short and medium term leases, or design leases to meet specific user needs. SSI is a subsidiary of The Fund American Companies.

Two new contracts for data processing equipment have been awarded to LMC Data, Inc. The company has received an order for a variety of unit record equipment from the Gazette Publishing Co. of Montreal, Canada, totaling annual rentals of $27,840, and a contract from Trans World Airlines to provide unit record equipment at the Rockleigh, New Jersey, facility for annual rentals of $13,056.

Planning Research Corp. Los Angeles, California will conduct a cost-effectiveness analysis of the U.S. Army Combat Service System under a contract with the Army Combat Developments Command. A Planning Research team of logisticians, automatic data processing specialists, and cost analysts will evaluate the cost and effectiveness of two alternative systems for handling Army combat service support data. The first alternative is an on-line system which will use the most recently developed computer equipment. The other alternative will use only those types of off-line data processing equipment available to the Army as of January 1, 1969.

Planning Research Corp. has also announced that it has been awarded a $1,045,000 contract by the Rome Air Development Center to continue development and implementation of a data handling system at the Aeronautical Chart and Information Center, St. Louis, Missouri. The Center provides maps and charts to the Air Force and other Department of Defense agencies. Its information data handling system, now partially completed, will be a step in automating the Center's cartography. The contract covers work through December 1969.

Potter to Receive Honorary Degree

TROY, N.Y. – John T. Potter, founder, president, and chairman of the Potter Instrument Co., Plainview, N.Y., will receive an honorary doctor of engineering degree from Rensselaer Polytechnic Institute June 7. Potter was a member of the class of 1933.

Potter Instruments, started 26 years ago with an invention and $2000, last year had $16.6 million in sales and held nearly 200 patents.

Air Canada passengers will be checked in electronically, as illustrated here, when the airline's new system goes into operation.

$10 Million in Terminals Ordered by Air Canada

TORONTO – Air Canada has ordered $10 million worth of digital information display systems to help speed reservations and scheduling on its worldwide air routes.

Last year, Air Canada carried 6.3 million passengers more than 5.3 billion miles across Canada, the United States, the Caribbean, Britain, and continental Europe.

A total of 1800 display consoles made by Raytheon and called the Dids-400 (digital information display systems) will be installed in 47 of the cities served by Air Canada.

The system is designed to reduce the work required of reservationists. It will give airline personnel access to information about any Air Canada flight anywhere in the world.

Faster Service

The terminals will simplify passenger check-in operations, allowing immediate call-up of seating plans, passengers lists, special service requirements, baggage charges, and other required information.

The Dids-400 is also being supplied for use in airline reservation systems for Air France, Iberia Airlines, and for a pilot system for American Airlines.

In the Air Canada system, 26 programmable control units will be used to tie the 1800 display devices with a Univac computer system.

Self-Contained Unit

The display console is self-contained. It can display up to 1485 characters on a 14-inch rectangular cathode ray tube (CRT) which is mounted in a cabinet containing character generator, display refresh memory, keyboard, display logic, CRT electronics, and power supplies.

Screen format is 33 lines with 45 characters per line, for a total of 1485 displayable characters. The characters are 0.12 inches wide by 0.16 inches high. The character repertoire includes a maximum of 64 symbols, including 26 upper case alpha and 10 numeric, space, punctuation, and special symbols.

The keyboard has 44 data entry keys, carriage return space bar, two shift keys, five control cursor keys, six message format keys, and two special function keys.

Most of the manufacturing of the displays will be carried out at Raytheon Canada Ltd., Waterloo, Ontario.

Drug Firm Orders 3-Computer Inventory Network

Davis Brothers, Inc., Denver, wholesale drug distributor, has ordered a three station computer network. Consisting of a Honeywell Model 200 computer system at Denver and two smaller 120 models at Albuquerque, N.M., and Missoula, Mont., the network will assist inventory control by determining the best stock level for each item in the warehouse.

Louisiana State University has ordered an SDS Sigma 5 computer from Scientific Data Systems to instrument its Simulation Research Laboratory. The University of Texas at Arlington has installed a $340,000 Sigma 5 which will be used, with three other computers, to teach computer techniques to students. Optek, Inc., Costa Mesa, Calif., has ordered a Sigma 5 to be used in feasibility studies, marketing operations, quotation preparation, scheduling and planning, inventory, and cost control.

Computer Test Corp., Cherry Hill, N.J., has ordered 13 SDS Sigma 2 computers for use in its Delta 400 Stored Program Magnetic Test System.

Mitsui & Co., Ltd., Tokyo, the second largest trading firm in Japan, has installed a $1.5 million Univac 1108 system which will be used to organize an on-line, real-time link between Tokyo headquarters and 45 branches and resident offices. The United States Bureau of the Census has installed an 1108 in preparation for the 1970 census. CHI Corp., Cleveland, a service organization owned by Case Western Reserve University, has installed an 1108 to process scientific and engineering problems for the university and to serve local industries.

Orders and Installations

Scottish & Newcastle Breweries Ltd. has ordered a $600,000 Honeywell Model 1200 computer system to help it promote the spirits of the English – and their ale, beer, and wine. Scheduled for delivery in December, 1968, the system will be applied to accounting, sales analysis, credit control, stock control, and sales forecasting. In Rome, Honeywell has opened a data processing center with a Model 1200, to provide computer service to businesses in central Italy.

Ampex Corp. has delivered the five hundredth unit of its Model RF core memory. The delivery was made to Radiation, Inc., Melbourne, Fla., which uses the memories in computers employed in government data acquisition systems.

Sylvan Pools, Inc., Doylestown, Penna., swimming pool contractor, has ordered a Univac 9200 for processing inventory, accounts receivable, payroll, and statistical management information. York County Earned Income Tax Bureau, York, Penna., has installed a 9200 for issuing tax notices and processing returns. Richter's Bakery, San Antonio, Texas, wholesale bakery, has ordered a 9200 to be used for route accounting and payroll processing.

Teen Inmates Study Programming

GATESVILLE, Texas – Computers are being used here to tackle one of society's most challenging problems: rehabilitating the young social dropout.

To help prepare juvenile delinquents for productive lives, the Texas Youth Council, which operates the state's training schools for delinquent children, is taking selected institutionalized youths without goals or sense of belonging and turning them into programmers and computer operators.

Dr. James A. Turman, council executive director, said that in the two years the computer course has been operating, it has proved highly effective.

Prepared by College

The program, developed and supervised by Texas A & M University, is no mere introduction to computers, according to Bennett Z. Kennedy, data processing instructor at Gatesville. Computer science students at the two Gatesville campuses – Mountain View and Live Oak – spend three hours a day, five days a week in classrooms outfitted with IBM systems.

The program, begun as an experiment using two IBM 1401 computers, will soon be using an IBM 1130 system and a System/360 Model 20. One unit will be installed at the Mountain View campus and the other at Live Oak. Kennedy said the two will be interconnected, permitting students at each campus to prepare and solve problems on both machines.

In class, the high school age youths learn computers from basic theory through the handling of business operations. The complete program takes about a year and a half.

What's a Pay Check?

Kennedy said that few boys entering the program have ever seen a payroll check. But by the end of the course, he explained, a boy could develop a company payroll program and process it on a computer. Or, he could develop computer routines for keeping track of a firm's inventory.

"The course is similar to a nine to 12-month fulltime computer training program at a business school," Kennedy said. "Each student is given plenty of actual experience working with a computer." The institution's two 1401 installations are devoted entirely to classroom use.

Upon completing each of three major sections of the program, the boys are awarded appropriate computer science graduation certificates by Texas A & M University.

Prestige Course

"Computer science is one of several vocational programs offered by the Youth Council, but it is a prestige course and therefore the attitude of the boys is especially good," Kennedy said. "One boy requested that his release be delayed so that he could complete the program."

Nearly 200 boys have studied computer science since the program's inception, and many have found rewarding positions awaiting them on their release, Kennedy said. Others, motivated by the course, have enrolled in college to develop their skills further.

Kennedy, 30, challenges his students on terms they understand. They're told that the rapid growth of the computer age has placed a premium on computer skills and that the financial rewards and advancement possibilities are there for those who apply themselves.

For most, the message has gotten through. And so far, not one computer science student released on parole has been returned.

COMPUTERWORLD

education

College Creates EDP Department

ST. PAUL, Minn. – Responding to the need for people trained in the uses of computers, the College of St. Thomas here has created a Quantitative Methods Department.

The department will begin operation this fall and will have a program offering either majors strictly in quantitative methods or a combination major of methods and mathematics, economics, or accounting. The college has offered some computer courses previously but not enough for a major.

Only 750 of the 2000 colleges or universities in the country offer computer courses and St. Thomas will be one of only 87 schools offering a degree in the field of data processing or computer science. Computer installations have increased 140% in less than three years and the schools have not kept up with the demand for trained personnel. Accent of the department will be on the computer as a tool, not the computer itself. Rather than making graduates merely programmers or technicians, it will train them how to use the computer, what it can be used for in various areas, and supply support knowledge to help graduates make the most of the capabilities of the computers.

The department will offer 16 courses dealing with data processing; applied statistics; numerical analysis and computer programming; information processing; machine oriented languages; problem oriented languages; operations research; system design, and pure research.

Graduates of the department will be able to go on for further schooling or take an immediate position in industry, government, or education with minimal on-the-job training. It now takes most companies six to 18 months training to bring their employees to this level.

The department will be an expansion of the present Computing Center, founded in 1964. There are 110 students now taking courses at the center. Since its founding, 560 students have taken computer related courses. The department will be under the chairmanship of James Lindsay, current director of the computing center, and will have a staff of at least four.

Sing Sing Graduates Computer Class

OSSINING, N.Y. – Twelve unusual men, 10 currently inmates at Sing Sing prison and two recently paroled from the prison, were awarded diplomas here following completion of a seven-month course in computer programming.

The pilot class at Sing Sing was set up in November, 1967. Applicants had to have a high school education and had to pass a rigid programming aptitude test.

Of the 33 inmates who applied, 14 were accepted. One was later transferred to another prison and one dropped out. The 12 remaining were greeted at graduation by their families and a host of public officials interested in penal rehabilitation programs.

Sen. Jacob K. Javits, R-N.Y., the keynote speaker, noted that the prison system is "a monument to the waste of people."

"We should use with our prison populations the same techniques and incentives that we are now employing with the hard core poor – namely, successful completion of a training program which will result in an assured job in industry.

"We should try, at least on a pilot basis, to develop job slots in industry for qualified inmates before they are released; and the federal government should provide supportive services to the prisoner in his new job after he is released, including essential follow-up counseling and bonding guarantees," Javits stated.

Warden John T. Deegan, Sidney Davis, president of Electronic Computer Programming Institute, and Paul McGinnis, state commissioner of correction, distributed diplomas to the 12 students.

McGinnis noted that the men had given up several hundred hours of recreation and family visitation time to complete the course and that "upon their release they will now have every opportunity for a meaningful future."

Two of the inmates, now paroled, have been placed in programming positions at Datatab, Inc., and Datamation, both New York City.

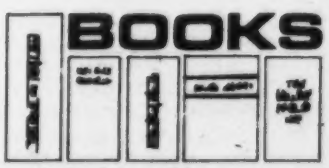
Inmates study computer programming in a guarded classroom at Sing Sing Prison.

Book Provides Nonmathmatical Explanation of Statistical Concepts for Laymen

Statistical Concepts and Applications, a Non-Mathematical Explanation. By Robert B. Miller. Science Research Associates, Inc., 192 pp., $7.45.

This is not a book to read. It is one to use as reference. It is therefore extremely unfortunate that it lacks an index. Its table of contents is complete, but a cross-reference by application would be invaluable, especially for those for whom the book was presumably written, "the layman who must plan, interpret, make decisions, and take action from data..."

Although Miller's goal is an excellent one, there seems to be a number of problems with his approach. He is, quite obviously, a statistician and naturally he has the priorities of a statistician. In his discussion of "standard deviation," for example, he gives the statistical definition first, complete with formula. He then proceeds with the possible uses of the



method. It would seem more logical, given his intended readership, for him to use a problem solving method, "How would one go about discovering . . ." rather than presenting a method in more or less of a vacuum.

Miller's training shows again in his tendency to use a term and to assume that it is understood. The first time he uses "regression," for example, the reader is told in a footnote, "Don't bother about what these terms mean. Read for context." The term, however, comes up again later. "An algebraic solution for the slope of the trend line can be calculated by regression analysis." Here, one cannot, obviously, read for context. A definition is finally given some 20 pages farther on.

One of the major merits of Statistical Concepts is its care in pointing out possible misinterpretations and pitfalls which attend specific statistical methods. This factor alone would make a reading of Miller's work valuable. Overall, however, to really make full use of this volume, one would have to know his way around mathematical statistics.

Students Love Their New On-Line Teacher

NEW YORK – Computer assisted instruction has been in full-scale operation in the New York City school system for eight weeks now [as of May 29], and one thing is already clear: the children love it. A more technical analysis of where the new system is successful and where it is less successful will not be possible until July, 1968, but the system has at least made the children enjoy learning, according to Dr. Shelley Umans, who is in charge of innovations for the New York City school system.

'Mesmerized'

"If you judge success by the fact that the kids are mesmerized by it – the house could fall down and they could not care less, they just keep banging away – then it is successful," Dr. Umans told COMPUTERWORLD.

An architect who recently visited an old, traditional school in the Bronx, and then visited the central computer center in downtown Manhattan, where the children in the classroom may be viewed on a color television monitor, remarked: "It is like walking from one century into another century." The "new education," Dr. Umans replied, "is so much more relevant to our existence."

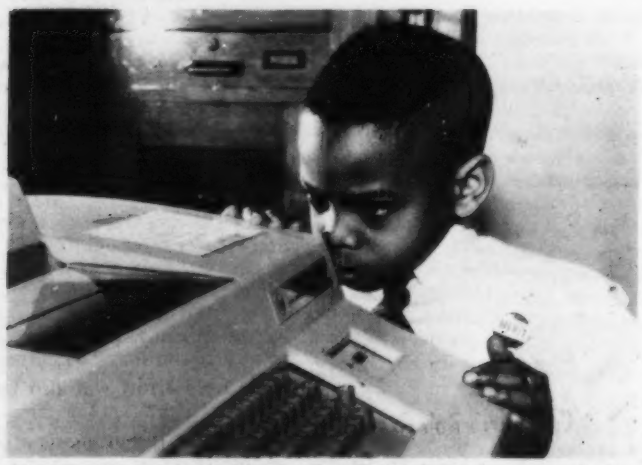
Too Expensive?

"Computer assisted instruction is expensive," the school innovater said, "and you can quote me on this. They had better come down in price. But, let us assume that the kids learn and that the kids like to learn. If that happens, it is priceless."

For 60 years, educators have been talking about "individual instruction," Dr. Umans explains, "and we never have been able to do it. The computer can do it. No teacher can do it. No programmed instruction text can do it. But the computer keeps adjusting the program every second to the next situation."

Dr. Umans, who calls herself a "change agent" or a "catalyst for change," said the more important question is not cost but effectiveness. The largest part of the American economy is devoted to defense, and the next largest to education she noted and "yet we still have not been able to make kids like to learn."

"If the computer accomplishes this, expense will not be the question," she said.



Man warily meets machine as Carl Richardson, 8, gets ready for his first conversation with the new electronic teacher at P.S. 244, Brooklyn.

15 Schools On-Line

The New York system consists of 200 RCA student instructional terminals located in 15 elementary schools in Manhattan, Bronx, and Brooklyn. In some schools, one or two of the teleprinter terminals are installed in several classrooms while in other schools they are clustered in a single classroom.

Each terminal is used in rotation by some 30 pupils during the normal school day and eventually by additional persons attending remedial, adult, or other instructional functions after school hours. The remote terminals are linked to small communications control units in each school. These in turn are linked to a central RCA Spectra 70 computer.

Enraptured by their new teacher, Rhoda Segan, left, and Michelle Weinberd watch breathlessly at P.S. 244, Brooklyn, as the remote computer grades their work and bids them a cheery "goodbye."

Each student goes to the terminal when his time comes, identifies himself by typing his name on the terminal keyboard, and receives anywhere from five to 20 minutes of instruction.

Students Participate

The student "converses" with the computer and becomes an active participant in the learning process. The computer acts like a private tutor, giving immediate reinforcement in the case of correct answers and appropriate feedback in the case of errors. Students are automatically directed to more challenging material or remedial instruction, on the basis of their performance.

By reference to each student's past performance record, the computer knows which particular subject matter to select for any particular student. In this way, every student receives up to 10 times as much individual attention during drill periods as the average classroom situation permits.

Clerical duties involved in teaching, such as correcting and grading of daily work, are also taken over by the computer, freeing the teacher for more important professional tasks. These include guiding the class through the inquiry and discovery process, and working with students who require special attention. An analysis of each student's progress and class summaries are provided daily, weekly, and monthly for the teacher, who can use this information to spot problem areas.

In addition to offering individualized instruction, CBI provides a research tool for investigators of the learning process itself. The rapid growth of information in this century has focused the attention of many educational researchers on development of more efficient methods of presentation. CBI aids in research by compiling and reporting statistics used in analysis of learning.

Updating Simplified

Since CBI materials are stored on a memory device at the computer installation they can be modified more readily and economically than can information in textbook form. Thus, subject matter experts can keep pace with current developments in their fields, and courses need not become out of date.

All curriculum material for the RCA-New York CBI system is prepared by textbook publishers such as Harcourt, Brace & World; Harper & Row, and the L.W. Singer Division of Random House. They work in cooperation with RCA's educational consultants, including Dr. Patrick Suppes and Dr. Richard Atkinson, both of Stanford University's Institute for Mathematical Studies in the Social Sciences, and Dr. Duncan Hansen of Florida State University.

When not used for educational purposes, the computer system can perform such educational services as library information storage and retrieval, student counseling, vocational guidance, and curriculum research and development.

It can also handle such administrative data processing functions as census, scheduling, attendance and grade reporting, payroll, financial and property accounting, test scoring and analysis, textbook ordering, and inventory control.

P.S. 244 students approach their electronic lessons with the concentration of chess players.

Computer Pictures Help Road Design

CHICAGO – Highway engineers today can take an "electronic ride" down a roadway that doesn't yet exist, visually inspecting safety, aesthetic, and design characteristics before the first shovel of earth is turned.

The vehicle for this toll-free preview is a perspective drawing generated by a computer and a graphic plotter.

"With the perspective sketch, an engineer can study mile after mile of a proposed highway design," said Merton Postle, vice president of H.W. Lochner, Inc. "If he sees something he doesn't like, he can issue change instructions and then see what betterments, if any, can be made.

Merton Postle reviews a computer generated perspective drawing of an expressway. The drawings enable engineers to check safety and aesthetic features of new highways before they are built.

"The advantages of this capability are extremely important to the taxpayer. It's a lot less costly to improve a design by changing a number on a punched card than it is by moving umpteen tons of dirt."

Postle said the program also gives the design engineer the opportunity to experiment with alternate designs without prohibitive cost.

The graphic presentation system is an outgrowth of a consolidated programming approach devised by the engineering company to produce final highway plans directly from field information and survey data.

"By eliminating tedious manhours on the drafting boards, we achieve two significant benefits," Postle said. "First, we speed presentation of final plans by a matter of months and at the same time substantially reduce their costs.

"Secondly, we free the engineer from the noncreative drafting job so that he can devote his imagination, talent, and time to the design itself, rather than to the reproduction of the design."

Material produced by the IBM 1130 computer and plotter includes a complete plan view depiction of the highway at typical plan scale or exaggerated scale; a profile plot-out which enables the engineer to design adequate drainage plans; and a contoured plan view of any area of the project showing the contours before and after the excavation or embankment.

Postle said final plans are traced from the plotted material on typical plan sheets. He said the company's computer division is trying to refine the process so that final plan sheets will be acceptable as produced by the plotter.

Tests and Paperwork Handled by Computer

PERTH AMBOY, N.J. – A community hospital laboratory here has brought automated laboratory testing within economic reach of the average medium-size community hospital.

The laboratory is the nation's first at a community hospital to go on-line on an operational basis. The computer also helps make diagnoses from certain tests.

Now fully operational at the Institute of Laboratory Medicine, Perth Amboy General Hospital, the system triples output of patient test data at no increase in cost to the patient and speeds reporting of some tests by up to 80%. It also presents the data in a form physicians can more readily interpret.

Operating Cost Cut

"The system does more of the job than anything presently available, yet its data processing portion costs only $.07 per patient day, about as much as it costs to change pillowcases on the patient's bed," said Dr. H.C. Pribor, institute director and chief pathologist. "Most other systems cost $.40 or more per patient day. That's more than most hospitals can afford."

The system should pay for itself out of savings within one year at a typical 500-bed hospital, according to Pribor.

Fast, accurate reporting of health data plus economies to the hospital and patient are counted as the key benefits of laboratory automation. Hospitals have long known these benefits, but few could afford the equipment outlay.

"It's well known that putting more data in the physician's hands earlier in the course of treatment can exert enormous leverage in speeding recovery and reducing hospital costs," Pribor said. "This capability is now within economic reach of the institutions which need it most – community hospitals."

The system consists of a Spear CLAS 300 computer linked directly to automated laboratory instruments, a typewriter, and printout equipment. Programming, the key to the small system's large capacity, is based on a language which, though tougher and more time consuming to write, takes less computer time for each step once the program goes into operation. The programming was developed over an 18-month period of collaboration between the institute and Spear.

The computer provides a printout on each specimen run through the 20-test screening.

Regular laboratory technicians run the system after only a few minutes' training. They exchange information and instructions via a small TV screen and the typewriter keyboard.

Testing Fully Automated

One of the system's assignments is automated biochemical testing. Once the technician loads the specimen, the system does all analyses and reporting. No manual steps intercede in data handling.

The institute runs a 20-test screening battery on all patients as they are admitted. Screening helps to give the physician a picture of the patient's total condition, and to pick up abnormalities not related to the cause for hospitalization. Results of the screening are posted within six hours of admission, nearly 18 hours sooner than was possible under manual operation.

In the biochemical testing sequence, a Technicon SMA-12 Autoanalyzer and an SMA-4 analyze the amount of hemoglobin, blood sugar, protein, cholesterol, and 13 other ingredients in the blood, and translates the amounts to voltages. These signal voltages are fed into the computer's memory. On demand, the computer prints out test results, together with all previous data on each patient. This printout is itself the report for the patient's chart.

Abnormalities Named

Another task is diagnostic interpretation of electrophoretic tests. The computer names possible conditions associated with test results. The protein electrophoretic test can detect such conditions as cirrhosis, diabetes, nephrosis, and some cancers. The LDH isozyme test can help detect tissue damage including myocardial infarction.

In either test, a technician simply inserts prepared specimens in an instrument called a densitometer. The densitometer "reads" each specimen and feeds its reading, in the form of voltages, to the computer. The computer makes the necessary calculations and compares results with patterns which are characteristic of certain diseases.

Finally, the computer prints out all numerical results, names the most likely disease, and lists all other diseases worth considering in light of the pattern. Time: five minutes. It takes an hour or more to process an electrophoretic pattern manually. The pathologist checks the result and signs the report for release to the patient's chart.

Routine Chores

"Although diagnosis by computer and on-line testing are the system's more exciting jobs, its major contribution is processing the day-to-day mass of data we generate in the care of patients," Pribor said. "We process tests for more than 100 patients every day, and keep track of results of literally thousands more. We probably handle more data than a small bank. The data load probably occupies 30% of each technician's time in a manual lab. The system recoups this for us and eliminates the error inherent in manual operation."

The patient's name and administrative data need be fed into the computer only once. Cross-reference permits call-up of patient data at any time, by name, hospital number, room number, or attending physician.

Routine jobs now done by computer include:

Pickup lists. Every morning, the computer generates blood specimen pickup lists for collection teams, one for each collector's route. It automatically prints out labels for specimen vials too. Result: a one manhour saving and elimination of errors due to mislabeling.

Work lists. Every morning the computer generates all instructions for technicians, such as tests to perform and loading order of specimen trays. Saving: two manhours per day.

Patient reports. All reports for the patient's chart are generated automatically, a job which represents about 20% of a laboratory's daily data load.

Management reports. The computer lists tests yet to be done, tallies tests done each day, reports results on control specimens introduced for quality control, and generates other operational reports on a regular basis.

Surgical and autopsy pathology. The computer stores and retrieves data for record keeping and statistical studies. It also generates a report every day on all patients due for surgery. This report, containing all previous diagnoses ever made on the patient, briefs the pathologist in case he is called in on consultation during surgery.

Dr. H.C. Pribor checks out the computerized electrophoresis program he helped to develop.

Computer's Role Grows

Work is underway to expand the system's role still further. Programs are now being developed for computerized acid-base balancing, and hormone evaluation of patients based on clinical as well as laboratory data.

In the area of biochemical testing, the institute classifies all data into six age groups for each sex, to establish more precise normal values than the single normals now used for all sexes and ages. A long term effort will also begin shortly to program the computer for differential diagnosis of biomedical profiles.

In the automated electrophoresis procedure, the system does all analysis of specimens, makes calculations, and helps make the differential diagnosis by naming possible conditions indicated by the analysis.

One small clerical job planned for the computer – instant status lookup – is expected to prove especially significant. Anytime a physician calls for results on his patient, the computer will either produce the final results or advise at what state the work stands. Such random calls for results of work in process usually disrupt laboratory operations seriously. The institute, which averages 50 such calls a day, estimates a five manhour saving per day by virtue of this capability alone. It developed this procedure for an earlier system using a Spear CLAS I computer and is converting it to the CLAS 300.

Forced Automation

Pribor also pointed out that hospital laboratories may have no choice but to automate in view of the rising laboratory test load coupled with the worsening technician shortage.

"Nationally, lab tests have increased from an average of 1-2 tests per patient day in 1954 to 5-7 tests in 1966, and there's no end in sight," Pribor says. "Moreover the technician shortage will reach 90,000 by 1975."

"The test load is somewhat higher at this institution – 10-12 tests per patient day – because of our extensive inpatient screening, and this probably pushed us to automate sooner," Pribor adds. "Under present circumstances, it's just a matter of time before every hospital must automate to some degree. This sytem demonstrates that hospital laboratories can afford automation and computerization today."

Papers Sought For 1969 SJCC Presentations

WELLESLEY HILLS, Mass. – A call has been issued for original technical papers on all aspects of the computer and information processing field for presentation at the 1969 Spring Joint Computer Conference.

T.H. Bonn, chairman of the conference's technical program committee, said papers must be submitted by Oct. 7 to be considered for presentation at the May 14-16 semi-annual conference in Boston's War Memorial.

"The purpose of the 1969 conference is to stimulate those engaged in research, advanced development, design, and usage of computers and their programs to communicate their ideas and experiences freely through presentation of high quality technical papers," said Bonn, assistant to the vice president of product planning and development at Honeywell's Electronic Data Processing Division.

"Free and timely communication of technical information has been responsible for the rapid growth of the computer field," he added. "It is our aim to continue and improve that communication in this forthcoming conference."

Secrecy and Privacy

He said authors should not be limited to the general fields of hardware, software, systems, and applications but should also consider the technical-social aspects involving the use of computers. He suggested authors submit original ideas and experiences relating to secrecy and privacy, the FCC inquiry into data communications, the design and promulgation of standards in the industry, problems of competition, and the direction of the industry's growth.

Five copies of the entire paper should be submitted, Bonn said, including a 100- to 150-word abstract and text of not more than 7500 words. A full set of rough illustrations, when applicable, should accompany the text and be keyed to it, he added. Final texts will be published in the conference proceedings by the American Federation of Information Processing Societies (AFIPS), sponsor of the Spring and Fall Joint Computer Conferences.

Papers should be submitted to T.H. Bonn, Technical Program Committee Chairman, 1969 Spring Joint Computer Conference, Honeywell EDP, 200 Smith St., Waltham, Mass. 02154.

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System Design Seminar Called

NEW YORK – The New York City chapter of ACM will present an in-depth "System Design Tutorial" at the Waldorf Astoria Hotel June 4-7, as a continuation of the national ACM seminars on time sharing.

Sessions will begin with a review of some of the concepts and terminology found in the state of the art presentations on time sharing and will include descriptions of systems with emphasis on design, decisions, and problems.

W.L. Konigsford, IBM Research, P.O. Box 218, Yorktown Heights, New York, is in charge of registration.

calendar

June 3-5, Chicago – "Computer Operation Management and Control." Contact: Brandon Systems Institute, 1611 North Kent Street, Arlington, Va.

June 3-5, New York – "Data Communications Seminar." Contact: The Registrar, University Computing Co., 1930 Hi-Line Dr., Dallas, Texas 75207. (Also: June 24-26, Washington, D.C.)

June 4-5, Los Angeles – "Management Standards for Data Processing." Contact: Brandon Systems Institute, 1611 North Kent Street, Arlington, Va.

June 6-7, Washington, D.C. – "Seminar on Optical Character Recognition." Contact: The Registrar, University Computing Co., 1930 Hi-Line Dr., Dallas, Texas 75207. (Also: June 27-28, Chicago, Ill.)

June 12-14, New York – ADAPSO 23rd Management Conference and Annual Meeting. Contact: J.L. Dreyer, Executive Vice President, ADAPSO, 420 Lexington Ave., New York 10017.

June 17-21, Washington, D.C. – "Computer Evaluation and Selection." Contact: R.F. McIntosh, Computer Learning, 6201 Leesburg Pike, Falls Church, Va. 22044.

June 17-28, Los Angeles, Calif. – "Computer Assisted Instruction Systems." Contact: C.N. Brooks, Education and Training Consultants Co., 815 Moraga Dr., Los Angeles, Calif. 90049.

June 24-28, Washington, D.C. – "Time Sharing." Contact: R.F. McIntosh, Computer Learning, 6201 Leesburg Pike, Falls Church, Va. 22044.

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Autodiagrammer Aids in Debugging

MCLEAN, Va. – Autodiagrammer II has been developed by Aries Corp. to generate full documentation for rapid and accurate checkout of Cobol programs before they are compiled.

William T. Miller, Jr., vice president of plans and programs, and head of Aries' Proprietary Products Division, said that Autodiagrammer II enables the programmer to see accurately, in final form, his flow chart and data printout with only one computer pass of his source deck.

Designed primarily for use with IBM System 360 computers, Miller said, "The beauty is that in addition to a detailed flow chart, it prepares a series of outputs which can be used in diagnosing the effectiveness of a program before the testing phase begins. It will accept a Cobol source program before it has been compiled and will automatically generate:

A detailed flow chart
A higher level logic chart
An input/output diagram
Formats of all defined records

Sample Formats of any reports which the program will be printing
A series of diagnostic tables and cross-reference lists.

"What this amounts to," he said, "is that we now have a tool to provide useful debugging information to a programmer before he begins compiling and testing his program. This, in effect, will reduce the amount of valuable computer time used for program checkout. Of course, Autodiagrammer II will also prepare the final post-test program documentation, and will guarantee that during program maintenance, documentation will not become outdated."

The program is adaptable for use with Univac 9300 systems, and BAL and Fortran languages are available as options. Deliveries, on a purchase basis, will begin June 1.

SOFTWARE FOR SALE

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Single program produces a cross reference by page/line, or compiler sequence, of all file, data, and procedure names contained in a COBOL source deck. Designed for S/360 DOS 32K and up. Send for full details.
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Contact: Kenneth G. Taylor
P.O. Box 831
Denville, N.J. 07834

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Program converts 1401 Autocoder source statements into IBM 360 DOS-BAL source statements. It is about 97% effective on typical 1401 tape programs.
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Simulator program called BTAM Simulator allows user to De-Bug System/360 Teleprocessing applications without actual terminal hardware and to by-pass communications with existing terminals – while checking out new applications. Developed by Programming Sciences Corporation/Int'l. Paper Company, Graphics Division, 90 Park Avenue, New York, N.Y. 10016.

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New System Aids Control Of Projects

NEW YORK – A proprietary software package that will enable managers of medium sized data processing installations to improve day by day scheduling, planning, and control of personnel and machine time has been announced by Brandon Applied Systems, Inc. The package, the Resource Management Systems (RMS), consists of two subsystems: one for operations control, the other for project control.

The RMS package is being developed by Brandon, assisted by sponsor companies which are participating in the final design. The two subsystems will be released separately, with the first, for operations control (OCS), available in the fall.

According to Max Gray, vice president of professional services at Brandon, RMS is designed to permit data processing managers to tailor it to their varying needs and service commitments. He said RMS is designed so that it will not interfere with most existing numbering and coding procedures.

Requires 65K

RMS is designed to be compiled and run on a minimum 65K IBM 360/30, under DOS. The system is written in Cobol E, with certain routines in ALP where technical factors preclude Cobol. Equipment scheduling can be done for any machine or combination of machines; each is considered as a work station, with qualitative and quantitative attributes. Multiprocessing environments are treated as multiple work stations. Interface with 360 OS can be provided for input data and scheduling purposes.

Gray said that extensive knowledge of operations control and project control methods is not required of RMS users. "Depending on the previous experience of those using the system, and on the size of the installations, training will vary from a few manhours to several manweeks. The training is geared to acquaint users with the principles of resource control underlying the system and with their roles in implementing and successfully using it."

Brandon will provide full implementation support, including training, to insure transition to the new system without disrupting workflow, Gray said. RMS will be continually maintained by Brandon to meet changing needs and to introduce refinements, he added.

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COMPUTERWORLD

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CSC-WU May Merge; UCC Drops Tender Bid

(Continued from Page 1)

utility network, including the possibility of organizing a subsidiary that would be a common carrier.

CSC provides computer and communications systems design, computer programming, and related services to industrial, scientific, and governmental organizations.

WU has devoted an increasing amount of its energy in recent years to the development and expansion of computer-controlled leased communications systems. This activity and related services produced more than $109 million of WU's $336 million revenues in 1967, Jones said.

"Complementing these services is Western Union's Telex service, which now has some 25,000 subscribers. Telex is now contributing more than $38 million of revenues annually," Jones said.

Founded in Los Angeles in 1959, CSC employs more than 3000 persons. The company has facilities in 22 cities throughout the United States and in six foreign countries.

New Registrations

ADVANCE CIRCUITS, INC., 14901 Minnetonka Industrial Rd., Hopkins, Minn., manufacturer of printed circuit boards, filed to register some 135,000 ("Reg.A") common. Proceeds from the offering, at $1.70 per share, will be used for debt repayment and equipment acquisition. The underwriter is Peter Peterson, Minnesota Federal Building, Minneapolis, Minn.

MAXSON ELECTRONICS CORP., Sunrise Highway, Great River, N.Y., a manufacturer who also provides computer services, filed to register some 200,000 common. Proceeds from the offering, with the price to be set by amendment – maximum $42 – will be used for debt repayment. The underwriter is Bear, Stearns & Co., 1 Wall St., New York.

RANDOLPH COMPUTER CORP., 200 Park Ave., New York, which leases IBM 360 computers and offers data processing services, filed to register some 400,000 common, 30,000 of which are to be offered by selling stockholders. Proceeds from the offering, with the price to be set by amendment – maximum $64 – will be used for equipment acquisition and will provide working capital. The underwriter, Wertheim & Co., 1 Chase Manhattan Plaza, New York, expects a June 10-14 offering date.

RESPONSIVE ENVIRONMENTS CORP., 200 Sylvania Ave., Englewood Cliffs, N.J., a supplier of automated educational materials, filed to register some 241,818 common, 59,533 of which are to be offered by selling stockholders. Proceeds from the offering, with the price to be set by amendment, will be used for debt repayment and expansion. The underwriters are Ladenburg, Thalman & Co., 25 Broad St., and Allen & Co., Inc., 30 Broad St., both of New York.

TELECREDIT, INC., 1930 Century Park W., Los Angeles, operator of a computerized check verification system, filed to register some 157,025 common, 57,025 of which are to be offered by selling stockholders. Proceeds from the offering, with the price to be set by amendment – maximum $17.50 – will furnish working capital and will be used for other corporate purposes. The underwriter, Laird, Inc., 61 Broadway, New York, expects a mid-June offering date.

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7080 160K system available for delivery Oct. 1968.
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Leasco Acquires 3% Of Reliance Ins. Co.

GREAT NECK, N.Y. – Leasco Data Processing Equipment Corp. has bought 138,000 shares, or about 3% of the outstanding stock of Reliance Insurance Co., Philadelphia.

The purchase was made for about $4.6 million sometime before April 3, according to the company, and Leasco reports it has purchased no further shares since.

A 404,500 block of Reliance stock recently was handled on the trading floor by the brokerage firm of Carter, Berlind & Weill. The firm would not divulge the name of the client or clients who bought this close to 10% share of the insurance company.

Indications are that a company other than Leasco, possibly another computer leasing firm, was involved in the transaction. Following the block trade, Reliance's chairman and chief executive officer, A. Addison Roberts, declined to disclose the name of the firm he thought was involved but did comment that "there seems to be a battle shaping up."

According to Saul Steinberg, Leasco chairman, a decision on whether to further add to or reduce his company's interest in Reliance won't be made until after a proposed offering of Leasco common stock and warrants now before the SEC is acted upon. Any comments made by Leasco in the interim might be construed by the SEC as tending to influence the price of the stock. The company did admit, however, that it "has been studying companies in the fire and casualty insurance field."

Both stocks set new highs during the week, and Leasco gained 16 points on Wednesday and 12 on Thursday. Reliance's stock led the most active list on the American Exchange Tuesday, and trading in it was active all week long.

Stock Trades At 4X First Price

NEW YORK – Traders bid as much as four times the $7.50 offering price during the first day of trading for Advanced Computer Techniques Corp. The 240,000 common shares offered were promptly sold. According to some over-the-counter dealers, a high bid of $30 was reached. Later in the day the stock eased to $20 bid and $22 asked.

The company, based in New York, develops software and functions as a management consultant. In the fiscal year ended March 31 the company earned $93,008 on sales of $1.7 million.

Faulkner, Dawkins & Sullivan Securities managed the underwriting for this new issue.

Nonprofit SDC Denies It Plans To Seek Profits

SANTA MONICA, Calif. – System Development Corp., a nonprofit research and development organization which specializes in the design and development of computer based command control and information systems for military, governmental, scientific, and educational applications, has denied rumors it plans to change its status to a profit oriented corporation.

A company spokesman did say, however, that the board of trustees, headed by Arnold O. Beckman, chairman of Beckman Instruments, "has on several occasions over the past few years given consideration" to such a change. The statement concluded, "there aren't any plans to announce a change in System Development's status at this time."

SDC contract volume is expected to total about $52 million for the year ended June 30. Fees earned from its contracts are now used principally to support the organization's advanced research and development programs.

Data Products, Mohawk, Dearborn Earnings Up

HERKIMER, N.Y. – Mohawk Data Sciences has recorded sizeable increases in revenues and profits during the latest quarter ended April 30.

Revenues jumped 111%, to $14,945,000 in 1968 from $7,070,000 in the 1967 quarter.

Net income rose 150%, to $1,275,000 from $510,000 and earnings per share increased to $.51 from $.22.

Nine-month revenues of $33,345,000 and net income of $3,060,000 were also reported for the company's domestic operations. However, comparable figures for the 1967 period were not given because of the discontinuance by Anelex (which merged into MDS in October 1967) during its quarter ended Sept. 30, 1966 of certain of its operations at a substantial loss and the consequent change in the character of its business.

WASHINGTON – Computer Leasing Co. has announced more than doubled earnings for the first quarter of 1968 over 1967.

Net income for the period ended March 31, 1968 amounted to $395,000, or $.12 per share, after taxes including the anticipated 10% surtax. For the comparable period last year CLC reported net income of $135,951, or $.05 per share.

The 190% jump in net earnings was surpassed by a 268% increase in revenues, which rose from $587,435 in the 1967 period to $2,163,000 for the latest three months.

A merger agreement between CLC and Standard Computers, Inc. is pending subject to the approval of stockholders of both companies in late June.

Financial Items

CULVER CITY, Calif. – Data Products Inc., a manufacturer of peripheral equipment and a supplier of software, has announced record sales, earnings, and backlog for their fiscal year ended March 30, 1968.

Erwin Tomash, president, reports sales have increased 60%, from $14,512,529 to $23,070,105 and net income amounted to $968,885 for the latest fiscal year, vs. a net loss of $25,470 last year.

Orders received during the year totaling $24,879,000 resulted in a year-end backlog of $16,329,000.

CHICAGO – Sharp increases in revenues and income have been reported by Arthur Weiss, president of Dearborn Computer Corp., for the second quarter ended April 30.

Revenues for the computer leasing company rose 85% over first quarter figures, to $1,232,000 from $665,000. Earnings increased 60%, to $161,000 from $101,000 reported for the three months ended Jan. 31.

As of April 30, Dearborn had $26,026,000 worth of equipment out on lease compared with $16,180,000 as of last Jan. 31.

The company began operations in June 1967, and went public Dec. 19, 1967.

To Write Off $1.8M

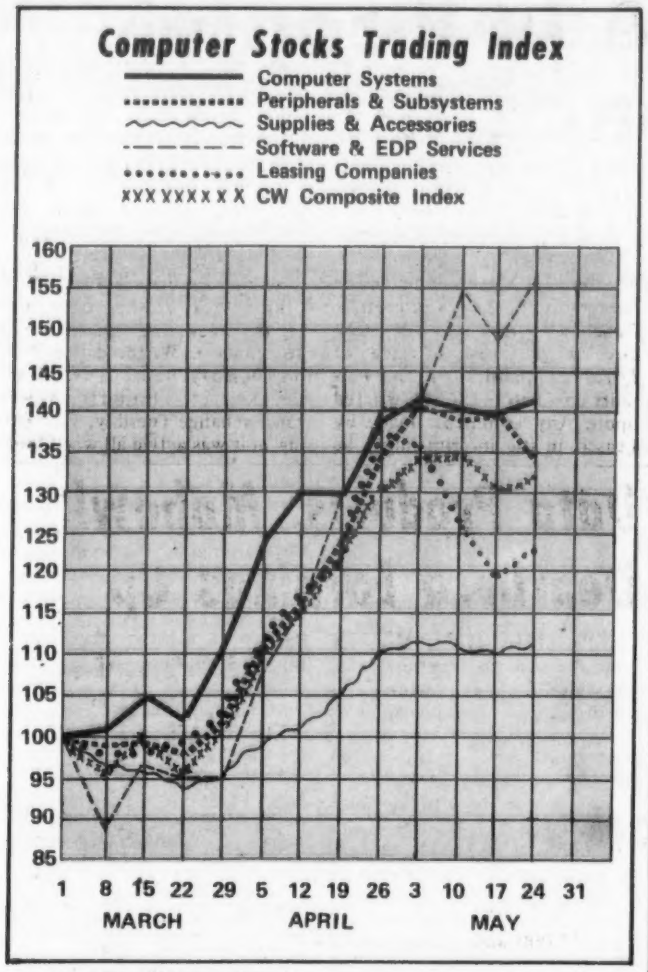
MAI to Report $350,000 Profit

NEW YORK – Management Assistance Inc. had an operating profit of more than $350,000 for the six months ending March 31, it was learned when the company stated that it had delayed general publication of the figures until July 8.

However, owing to the scheduled writing off of some $1.8 million in deferred costs during the period (as explained in the 1967 annual report) the figures will show an apparent loss of nearly $1.5 million.

The reason for the present situation is because of the decision last July to stop deferring lease acquisition, foreign development, and other costs and to write off the already accrued deferred costs in a two year period ending this September. As a result, current figures reflect the costs of all current operations and of those which had previously been deferred.

The delaying of the six-month report is apparently because of the need to update a registration statement for the 75,000 common shares which would be issuable if a block of preferred shares were converted to common. Such updating is required whenever the stockholder requests it.



Index Up Again; Fabri-Tek +31%; CN Falls 26%

CW's Computer Stock Composite Index gained 1.80% last week as the Dow Jones industrial average continued to decline, losing 0.45% to stand at 895 on Friday's close. Gainers outnumbered losers among computer stocks, 47 to 31, with three remaining even.

Systems Engineering Labs gained 13% to lead the stocks of computer manufacturers. Both NCR and SDS moved up 6% during the week, while Collins Radio lost 6% to 73-5/8. Scientific Controls which had gained 40% in the previous week, was off 2% to 58 last week.

Several stocks in the Peripherals and Subsystems sector made substantial gains although the sector index was off slightly. Fabri-Tek led all computer stocks with a 31% gain, on rumors that Honeywell is interested in acquiring the company. Alphanumeric posted another substantial gain. The stock jumped 24% to 62 and stands 195% above the March 1 base price. Addressograph-Multigraph gained 20% to 81-5/8, following reports of a 47% rise in net income for the third quarter. Other gainers in the sector included Gerber Scientific, up 18% to 59; Photon, up 13% to 113-1/2; Potter Instrument, up 12% to 31-1/4; and Sanders, up 10% to 52-3/8. The largest loss in the sector was suffered by Digitronics, which was off 8% to 23.

Losers outnumbered gainers in the Supplies and Accessories sector as one stock, UARCO, set a new 1968 low. Wallace Business Forms was off 6% to 29; Adams-Millis lost 5% to 25-3/4; and UARCO lost 4% to 32-1/4, or 14% below the March 1 base price. Barry Wright gained 10% to 36 during the week, and Memorex moved up 9% to 72.

The stocks of the two companies in the Software and EDP Services sector which have been involved in attempts to acquire part or all of Western Union (see story on page 1) gained ground last week. Computer Sciences led the sector with a 15% gain to 59-5/8 while University Computing rose 7% to 108 during the week. Other gainers included Applied Data Research, up 12% to 27; Digitek, up 8% to 16-1/4; and Brandon Applied Systems, up 7% to 19-3/4. Computer Network (CN) dropped 26% to lead the losers among computer stocks. But the stock, at 43, is still 43% above the March 1 base price. Computer Usage, one of the two below-base price stocks in the sector, lost 5% to 35-1/2. The other below-base price stock, TBS Computing Centers, gained 6% to 14. TBS still stands 32% below its March level.

DPA, Inc. with a gain of 20% to 17-1/4, led the Leasing sector. Leasco, involved in merger rumors with Reliance Insurance, gained 16% to 165. Dearborn Computer, third largest loser in the sector during the previous week, made the third largest gain last week. Dearborn was up 7% to 32. Management Assistance lost 9% to 10-7/8, its March 1 base price.

COMPUTER STOCKS: TRADING SUMMARY

Week Ending May 17, 1968

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	COMPUTER SYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	163 3/8	220–157	199 1/4	• Burroughs	– 1 1/4	– 0.62	+ 21.95
NYSE	67 3/4	101– 65	73 5/8	Collins Radio	– 5 1/8	– 6.51	+ 8.67
NYSE	101 1/2	160– 95	144 1/4	• Control Data	+ 3	+ 2.12	+ 42.11
AMSE	102	160– 95	134	• Digital Equipment	– 1 3/4	– 1.29	+ 31.37
NYSE	87 1/4	100– 84	88 1/4	General Electric	– 2 5/8	– 2.89	+ 1.15
NYSE	60	83– 59	84 1/4	Hewlett-Packard	+ 3/8	+ 0.45	+ 40.42
NYSE	93 1/8	136– 89	136 1/2	• Honeywell	+ 3 1/2	+ 2.85	+ 35.84
NYSE	577	701–360	653	• IBM	+ 3	+ 0.46	+ 13.17
NYSE	103 7/8	141– 99	136	• Nat Cash Register	+ 7 1/2	+ 5.84	+ 30.93
NYSE	78 1/4	53– 45	50 1/4	NCR	– 1/8	– 0.25	+ 7.20
NYSE	46 7/8	106– 73	98 7/8	Raytheon	+ 3 7/8	+ 4.08	+ 26.36
OTC	22 1/2	59– 20	58	• Scientific Controls Corp.	– 1	– 1.70	+157.78
NYSE	118 1/8	172–108	150 1/2	• Scientific Data	+ 8 1/2	+ 5.98	+ 27.40
NYSE	45	63– 42	53 3/8	• Sperry Rand	+ 3/8	+ 0.71	+ 23.06
OTC	22 1/2	33– 20	31 3/4	• Systems Engineering Labs.	+ 3 3/4	+ 13.39	+ 41.11

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	PERIPHERALS & SUBSYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	58 3/8	85– 52	81 5/8	Addressograph-Multigraph	+ 13 3/8	+ 19.60	+ 39.83
OTC	21	62– 45	62	Alphanumeric	+ 12	+ 24.00	+195.23
NYSE	29	37– 26	30	Ampex	– 7/8	– 2.83	+ 3.45
OTC	17 1/4	27– 16	21 1/4	Bolt Beranek & Newman, Inc.	+ 1 1/2	+ 7.59	+ 17.39
AMSE	13 1/2	19– 12	15	Bunker-Ramo	– –	– –	+ 11.11
AMSE	32 1/8	47– 27	41 1/4	• Calcomp	+ 2 7/8	+ 7.49	+ 28.05
OTC	15 1/4	22– 13	18 7/8	• Data Products	+ 1/2	+ 2.72	+ 23.77
OTC	19 1/4	27– 16	25	• Digitronics	– 2	– 8.00	+ 19.48
OTC	39	57– 33	46	• Electronic Memories	– 1/2	– 1.08	+ 17.95
OTC	10	18– 9	18 1/8	• Fabri-Tek	+ 4 1/4	+ 30.63	+ 81.25
OTC	34	59– 28	59	Gerber Scientific	+ 9	+ 18.00	+ 73.52
AMSE	16 7/8	45– 14	41 1/2	Milgo Electronics	– 1	– 2.35	+145.92
AMSE	115 1/8	195–108	181 3/4	• Mohawk Data Sciences	– 1 1/2	– 0.82	+ 57.87
OTC	74	136– 71	118	• Optical Scanning Corp.	– 1	– 0.84	+ 59.45
OTC	72	114– 64	113 1/2	Photon	+ 13	+ 12.93	+ 57.64
AMSE	25 5/8	38– 20	31 1/4	• Potter Instrument	+ 3 1/4	+ 11.61	+ 21.95
OTC	40 1/4	92– 38	88	• Recognition Equipment Corp.	+ 1/2	+ 0.57	+ 18.63
AMSE	16	29– 14	26 1/8	Rixon Electronics	– 1/8	– 0.48	+ 63.28
NYSE	46 1/8	66– 42	52 3/8	Sanders	+ 4 7/8	+ 10.26	+ 13.55
OTC	40 1/2	51– 35	46	• Tally Corp	– –	– –	+ 13.58
NYSE	242 1/4	304–229	286 3/4	Xerox	+ 9 1/8	+ 3.29	+ 18.36

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SUPPLIES & ACCESSORIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	48 1/2	64– 41	56	• Acme Visible	+ 2 1/2	+ 4.67	+ 15.46
NYSE	20 1/2	32– 19	25 3/4	Adams-Millis	– 1 1/2	– 5.51	+ 25.61
OTC	13 5/8	17– 13	14 3/4	• Baltimore Business Forms	– 1/4	– 1.67	+ 8.25
AMSE	27	36– 22	36	• Barry Wright	+ 3 3/8	+ 10.34	+ 33.33
OTC	27 1/4	33– 26	32 1/2	• Ennis Business Forms	+ 3/4	+ 2.36	+ 19.27
NYSE	84 1/8	108– 81	107 3/4	• 3M Company	– 1/2	– 0.46	+ 28.08
OTC	58	74– 49	72	• Memorex	+ 6	+ 9.09	+ 24.14
TOR	27 1/4	32– 25	30 3/4	• Moore Business Forms	– 1	– 3.15	+ 12.84
NYSE	57 1/4	70– 47	70	Nashua Corp.	– –	– –	+ 22.27
OTC	31 1/4	37– 30	37 1/2	Reynolds & Reynolds	+ 1/2	+ 1.33	+ 20.00
OTC	34 1/2	35– 25	27 1/2	• Standard Register	+ 1/2	+ 1.85	– 20.29
NYSE	37 3/4	44– 32	32 1/4	• Uarco	– 1 3/8	– 4.09	– 14.57
AMSE	34 1/4	22– 13	17 3/4	Wabash Magnetics	– 5/8	– 3.40	+ 24.56
OTC	25 3/4	36– 24	29	• Wallace Business Forms	– 2	– 6.45	+ 12.62

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SOFTWARE & EDP SERVICES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	17	27– 14	27	• Applied Data Research	+ 3	+ 12.50	+ 58.82
OTC	15 1/2	24– 15	18 1/2	• Aries	– –	– –	+ 19.35
AMSE	47	66– 42	55 3/4	Automatic Data Processing	– 2 1/4	– 3.88	+ 18.62
OTC	9	20– 6	19 3/4	• Brandon Applied Systems	+ 1 1/4	+ 6.76	+ 119.44
AMSE	22 7/8	43– 21	26 3/4	Computer Applications	+ 1 1/8	+ 4.39	+ 16.94
OTC	30	60– 24	43	Computer Network	–15	– 25.86	+ 43.33
AMSE	40	63– 32	59 3/8	• Computer Sciences	+ 7 5/8	+ 14.66	+ 49.06
OTC	39	62– 37	35 1/2	• Computer Usage	– 2	– 5.34	– 8.97
OTC	36 1/2	58– 36	53 3/4	• Computing and Software	+ 2 3/4	+ 5.19	+ 32.74
OTC	12 1/2	20– 9	16 1/4	• Digitek	+ 1 1/4	+ 8.33	+ 30.00
AMSE	38 3/8	52– 26	41 1/8	Electronic Computer Prog. Inst.	– 1 5/8	– 3.80	+ 7.17
OTC	35	60– 32	58	• Informatics	+ 3	+ 5.45	+ 65.71
OTC	11 1/2	27– 8	23	• National Computer Analysts	– 1	– 4.17	+ 100.00
AMSE	31	43– 28	39 3/4	Planning Research	+ 1/2	+ 1.27	+ 28.23
OTC	9	15– 8	11 1/4	Software Systems	– 1/4	– 2.18	+ 25.00
OTC	20 1/2	22– 13	14	TBS Computing Centers, Inc.	+ 3/4	+ 5.66	– 31.71
OTC	63	111– 57	108	• University Computing	+ 7	+ 6.93	+ 71.43

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	LEASING COMPANIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	19 1/4	25– 18	25 1/2	Chandler Leasing	+ 1 1/2	+ 6.25	+ 32.47
AMSE	25 1/8	35– 21	31 1/8	• Computer Leasing	+ 1 3/4	+ 5.96	+ 23.88
OTC	12 1/4	19– 11	13	• Cyber-Tronics	– 3/4	– 5.46	+ 6.12
AMSE	106 5/8	184– 94	121 3/4	• Data Proc. Financial & General	+ 1 3/4	+ 1.46	+ 14.18
OTC	12 1/2	17– 11	11 5/8	Datronic Rental	+ 1/8	+ 1.09	– 7.00
OTC	20	35– 18	32	Dearborn Computer	+ 2 1/4	+ 7.56	+ 60.00
OTC	13 1/4	17– 12	17 1/4	• DPA, Inc.	+ 2 7/8	+ 20.00	+ 30.19
AMSE	28 3/4	43– 27	37	• GC Computer Corp.	+ 1/2	+ 1.37	+ 28.69
AMSE	98	171– 90	165	• Leasco	+ 22 3/4	+ 15.99	+ 68.37
AMSE	45 7/8	94– 41	73 1/4	• Lewis-Townsend Computer Corp.	+ 1 1/4	+ 1.74	+ 59.67
OTC	10 1/2	16– 7	8 3/4	• LMC Data, Inc.	– 1/4	– 2.78	– 16.67
OTC	10 7/8	16– 10	10 7/8	• Management Assistance	– 1 1/8	– 9.38	– –
AMSE	41 5/8	53– 25	41 1/2	National Equip. Rent.	– 5/8	– 1.48	– 0.30
AMSE	38	64– 35	52 1/8	• Randolph Computer Corp.	+ 1/4	+ 0.48	+ 37.17
AMSE	10 7/8	18– 10	17 5/8	U.S. Leasing	– 1/2	– 2.76	+ 62.06

*Companies included in Computerworld's stock trading index for each sector.

Wall Street's View

Buying Honeywell on Dips Suggested

COMPUTER SCIENCES – Philips, Appel & Walden recommends "staying loose," pending the outcome of recent "huge volume" trading.

CONTROL DATA – Bache & Co.'s chartist notes that CDC violated a short term support level by closing below 148. However, considering the underlying support in the 136-140 zone, Bache recommends that positions be maintained. Philips, Appel & Walden, on the other hand, suggests selling short.

DATA PROCESSING FINANCIAL & GENERAL – Philips, Appel & Walden suggests purchases be made at current levels, with a protective stop placed at 115-7/8, and sees an objective to 155-160.

HONEYWELL – Bache & Co. notes that considerable support for the stock lies in the 115-120 range, and suggests adding to positions, preferably on dips below 120.

SCIENTIFIC DATA SYSTEMS – Reynolds & Co.'s chartist thinks that sharp near term setbacks have probably shaken out some traders. However, he does not believe the SDS formation has reached a "top" at this time. A longer term upswing is foreseen after this short interlude.

'The Name of the Game Is People'

The following speech on personnel development by Theodore K. Keith was made at the recent National Automation Conference held by the American Bankers Association. Because it was made to a limited audience but deals with a problem that affects all of us, COMPUTERWORLD thought it deserved a larger audience. Keith, senior vice president of the First Union National Bank, Charlotte, N.C., points out that the name of the game is not "hardware" or "software" but "people."

The name of this morning's session is "Personnel Development." In reviewing the direction I wished my remarks to take, I was impressed that of 36 sessions being conducted here in Miami Beach, there is only one oriented toward the most serious implementation problem that we have in data processing today; namely, people. We have sessions on CIF, PIP, hardware, software, operations research, market research, and systems design, but only one session involved with people and management. Let's look at it another way. This morning we are one of eight concurrent sessions. If we had 1/8 of the conference in attendance, we would have about 200 people present this morning. The small number of people actually in attendance indicates how strong is the technical orientation of our data processing and operations management. Unfortunately, you folks who are here are the wrong people for me to be addressing. You are interested and concerned enough about this subject to be at this session, instead of at one of the other seven. I really wish that our presentations this morning could be made to the rest of the conference. That is the audience we need to reach.

In data processing, more than ever before, the name of the game is "people." In installing complex third generation equipment using random access storage and communications devices, and in building complicated integrated systems, we face a need for more sophisticated, knowledgeable, productive people than ever before. This extends from the banks' need for quantitatively oriented top management, through our operations management, systems men, programmers, computer operators, and even keypunch operators. Examine the number of banks who have changed their top data processing management in the last several years. Consider the constant flow of "experienced" people from one company to another. Read the want ads in the American Banker and your local paper, and listen to the problems discussed in the corridors here at the Automation Conference. In general, the problem as stated is, "How do I find enough of the right kind of experienced people to do the job I need to have done?"

I would like to restate the problem. I just made a visit to one of the major New York banks where there are 400 systems men on one floor. I talked recently with a California bank of much smaller size who had 90 programmers. I think of IBM's thousands of talented people working on software and applications and examine, in this light, the progress we are all making. I would like to state the problem as being one of how we develop, motivate, and retain our able people. This is much more vital than finding men, since my experience is that, if your environment is right, capable people will come and find you.

The Key Is Motivation

The key is motivation. If we are successful in motivating our people, they will develop themselves and they will stay with us to an extent not thought possible today. In addition, as I have just mentioned, the word gets around and other good people come seeking out your bank because it is the kind of place they want to work. To a large extent, motivation is the most written about, most vital, and least understood aspect of the management of people. I would like to call your attention to several sources of information in this regard. Two books are particularly significant: Batten's "Tough-Minded Management" and McGregor's "The Human Side of Enterprise." Each of these has been around a while, and perhaps you have already digested their material. More recent, however, is an article in the January-February, 1968, issue of Harvard Business Review, by Hertzberg, entitled "One More Time – How Do You Motivate Employees?" Hertzberg points out that much management philosophy is based upon what he calls the "KITA Approach." The letters stand for "Kick In The Posterior" or the "tell 'em what to do" approach. He refers to dictatorial management as "negative KITA." He points out that a bribery approach is still KITA, calling it "positive KITA." He classifies shorter work hours, spiraling wages, fringe benefits, and participative communications as being policies of this sort. However positive this KITA is, he states emphatically that it is not motivation. He makes the comparison to seduction as opposed to rape and comments that, in a way, seduction is worse than rape, since the man is party to his own downfall. These so-called techniques of motivation miss the point of getting people to want to contribute, and to acquire a sense

(Continued on page 15)

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'Motivation Is the Key' To Retaining Personnel

(Continued from page 14)

of involvement and a burning enthusiasm that provides real job satisfaction.

A recent study among seventeen hundred people was made to determine factors producing satisfaction versus dissatisfaction in a position. Rather surprisingly, dissatisfaction is found not to be the opposite of satisfaction. The factors providing job satisfaction in order of importance came out as follows:

1. Achievement
2. Recognition
3. The work itself
4. Responsibility
5. Advancement
6. Growth

Significantly, the absence of satisfiers does not necessarily produce significant dissatisfaction. The items producing dissatisfaction in order of importance were as follows:

1. Company policy and administration
2. Supervision
3. Relationship with supervisor
4. Working conditions
5. Salary
6. Relationship with peers
7. Personal life
8. Relationship with subordinates
9. Status
10. Security

And as I have mentioned a moment ago, absence of these factors reduced dissatisfaction but did not produce satisfaction. Notice that salary, status, security, working conditions, and personal life were only things where dissatisfaction can be removed but not where satisfaction can be gained. Most of our bank personnel policies have been based around removing dissatisfiers, not in creating satisfiers. It is significant also that salary, status, and security are not even major elements of dissatisfaction.

Job Satisfaction

To motivate people we need to produce job satisfaction in the true sense. Mr. Hertzberg refers to this technique as "job enrichment." How can we, in fact, produce "job enrichment?" There are many ways tha come to mind, and I am sure you can add many more to the ones which I will mention. We should add responsibility and additional functions to challenge the capacity of every man on an individual basis. We should give him more responsibility, perhaps before we consider he is ready for it. We should make craftsmen, not specialists, allowing a man to follow the job through. We should encourage decision making at the lowest level practical. We should promote a man when he is ready for promotion, not when an opening exists, encouraging promotion paths to other areas of the bank. We should attempt to have our junior men involved with management and have them visit and communicate with other departments to improve the feeling of work importance. We should assign special project work, if we feel a man has the capability to contribute extra effort. We should design and communicate the kind of dramatic, far-reaching program that creates pride of achievement at all levels. And lastly, we should recognize performance in as many ways as possible.

In summary then, I would like to borrow from Mr. Hertzberg: If you have someone on a job, use all his ability. If you can't use him completely on the job, get rid of him, either via automation or by selecting someone with less ability. If you can't use him properly and you can't get rid of him, you are sure to have a motivation problem. If we spent only a percentage of the efforts directed toward equipment research and evaluation, systems design, software studies and the like on motivation, our third generation efforts would move ahead by leaps and bounds.

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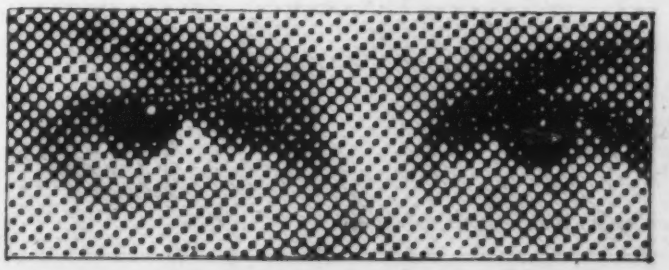
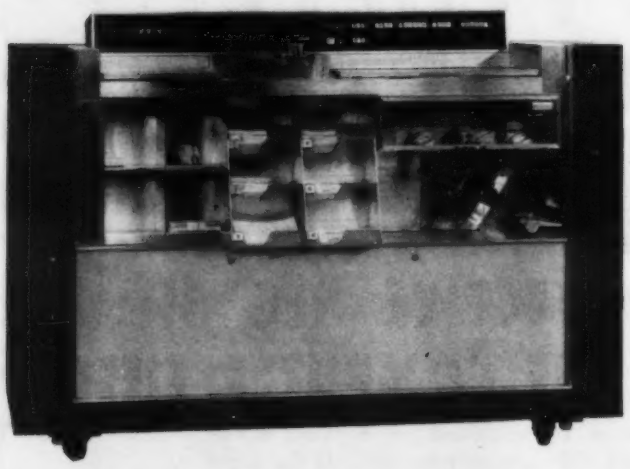


for more information call Bob Ziegel (617) 332-5609

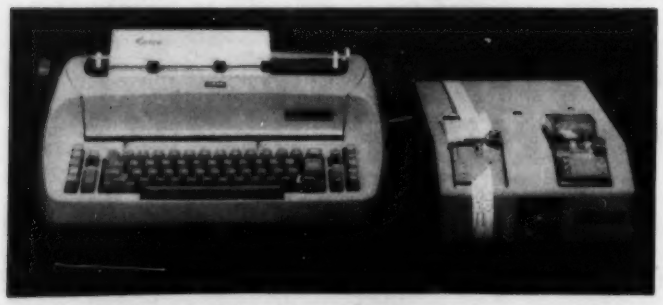
New BR 2204 Terminal Has Detached Keyboard

The new BR 2204 I/O terminal has a cathode ray tube display screen with a detached keyboard and operates at speeds up to 2400 bits per second over data phone circuits with any computer that has real-time capability. The 12" CRT screen can display up to 960 characters. An entry marker can be positioned at any point for tabulation, deletion, or insertion of characters or lines by use of the standard alphanumeric typewriter keyboard and an optional 10-key numeric block. Monthly rental, including maintenance of the basic unit, is $190. The device can be equipped with a printer to produce hard copy output. Bunker-Ramo Corp., Business and Industry Division, 445 Fairfield Ave., Stamford, Conn.

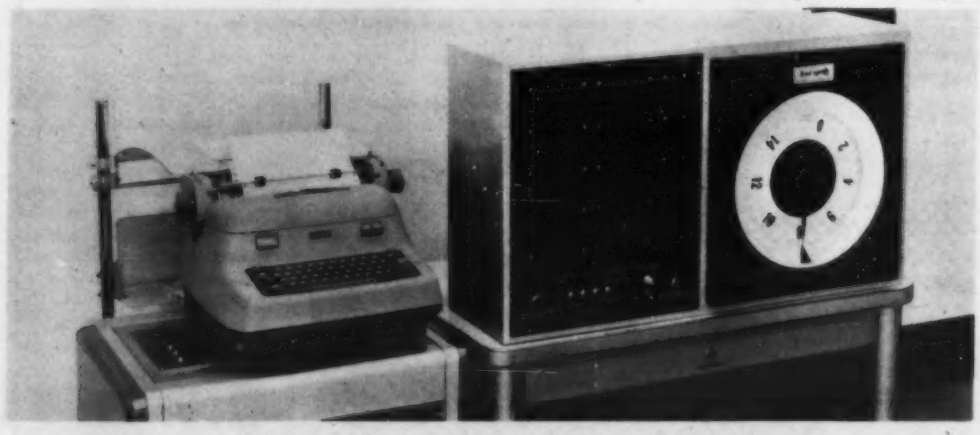
Bunker-Ramo's new data entry and retrieval device designed for single station use. The unit can display 960 characters.



Cummins-Chicago's Scanak 216 provides optical scanning of four machine languages on the same document during a single pass.



EPSCO's Edityper 200 Automatic Typewriter System includes editing capabilities and a single or dual punch and reader.



Neptune's electronic digital recorder permits visual checking of heat readings through Hot Spot heat detector cables that are hung vertically in the area being monitored.

New Products

Graphics Terminal

A new graphics terminal accommodates up to four remote display scope stations. The AGT/10 displays more than 4500 lines at 40 frames/second and resolution is better than 100 lines per inch. Features include continuous image translation and image scaling, programmatic control of alphanumeric font and size, a 30-bit internal processor with 4k of core memory, teletype I/O, and five priority interrupt channels. Software includes a resident monitor, Fortran compiler for systems with at least 8k, macro assembler, utility and service routines, graphics operators, and a display editor. Price is $60,000. Remote stations cost less than $25,000. Adage, Inc., 1079 Commonwealth Ave., Boston, Mass. 02215.

Optical Scanner

A new optical scanner is a combination of a mark reader, a bar code reader, and a perforated character reader with the capability of reading a five-level code that can be produced by any computer line printer. Any existing program can be patched to print the essential transaction information in the five-level code at the same time that the information is being printed visually. The Scanak 216 system is capable of reading any combination of from two to four different codes on the same document in one pass, thus simplifying the creation of turnaround documents and making automatic input feasible in many cases where it was not previously practical. Cummins-Chicago Corp., 4740 North Ravenswood Ave., Chicago, Ill. 60640.

Automatic Typewriter

A new solid state 175 wpm automatic typewriting system has editing capabilities and single or dual punch and reader. The Edityper 200 records repeatedly used information on a punched paper tape and stores it for future use. The system can be programmed to stop at any point in the text to permit revisions, additions, or deletions. When not used in its automatic mode, the Edityper 200 serves as a standard IBM Selectric typewriter. Price of the basic Edityper 200 is under $4000; with the Editron editing unit, it is priced under $5500. Edityper Division, EPSCO, Inc., 411 Providence Highway, Westwood, Mass. 02090.

The new Adage Graphics Terminal can accommodate up to four remote display scope stations and display more than 4500 lines at 40 frames per second.

Digital Recorder

An electronic digital recorder is being offered as a new optional office control unit for the Neptune Model AR (automatic, remote) Hot Spot Heat Detection System. Designed to increase speed and efficiency, use of the recorder permits automatic, high-speed visual recording of heat readings. The unit has three basic components: a monitoring board to indicate which heat detector cable is transmitting data, and which thermocouple in the cable is sending electrical impulses; a visual reader to check heat readings being recorded; and a digital recorder to record the heat readings automatically for later reference. Neptune Meter Co., 47-25 34th Street, Long Island City, N.Y.

Coordinate Digitizer

Manual operation of a new Large Area Coordinate Digitizer enables operators to read, measure, and automatically record sequence numbers and xy coordinates on punched cards. The digitizing area is 42 x 60 inches. System options include punched paper tape output, flexowriter, and magnetic tape output. A grid recognition option allows the operator to select rounded-off grid factors of .001, .025, .050, .080, .100, .200, or .250. Other options include a patchboard for altering the output data block format, and a full alphanumeric keyboard similar to a standard typewriter keyboard for inserting data directly into the output device. The Gerber Scientific Instrument Co., P.O. Box 305, Hartford, Conn. 06101.

Tape Certifier

Control Data's new CDC 686 tape certifier cleans and certifies tapes at all standard tape densities using industry accepted testing formats. The unit will handle one-half inch magnetic tape at 150 ips and test tapes on seven or nine tracks, full width or total surface. Tape densities can be 556 bits per inch (bpi), 800 bpi and 1600 bpi. Options include a tape wear test facility, one additional tape density between 556 and 1600 bpi, error location printer, and zoom microscope. Control Data Corp., 8100 34th Ave. South, Minneapolis, Minn.

Paper Tape Reader/Punch

A new table-top paper tape punch and reader for System/360 is designed for data handling at speeds up to 120 cps. The IBM 1017 reader and the 1018 punch may be used in typesetting and machine tool control applications. The 1017 and 1018 can read and punch five- through eight-channel paper tape and "advanced feed-hole tape" used by the printing and publishing industry. The units will accept 11/16, 7/8, and one inch wide tapes. Up to eight readers and eight punches may be attached to System/360 Models 25 through 50 with a single control unit, the 2826. Monthly rentals for the 1017 strip and reel feed models are $50 and $75 respectively, and for the 1018, $125. The 2816 Control unit rents for $370 to $1100, depending upon the number of readers and punches attached. Initial customer deliveries are planned for the third quarter of 1969. IBM, Data Processing Division, 112 East Post Rd., White Plains, N.Y. 10601.

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